

Massachusetts Division of Health Care Finance and Policy

Preventable Hospitalization in Massachusetts

Update for Fiscal Years 2002 and 2003

May 2005

Paul J. Cote, Jr., Commissioner



Mitt Romney, Governor
Commonwealth of Massachusetts

Ronald Preston, Secretary
Executive Office of Health and Human Services

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Executive Summary

This fifth report in the series on preventable hospitalizations examines, for the first time, the numbers of preventable emergency department (ED) visits, in addition to observation stays (introduced in the fourth report), and preventable hospitalizations. Also new to this report is a breakout of preventable: hospitalizations, observation stays, and ED visits by race.

From Fiscal Years 1998 and 1999 (FY98/FY99) to Fiscal Years 2002 and 2003 (FY02/FY03), preventable hospitalizations for all Massachusetts residents per 1,000 population increased 3%, but not as much as total hospitalizations (4.9%).¹ Therefore, preventable hospitalization (PH) rates decreased relative to total hospitalization (TH) rates. The relative decrease was also true for people ages 0-64 and people ages 65 and older.

Perhaps the more unusual trend was the decrease in the number of observation stays. From FY98/FY99 to FY02/FY03, total observation stays decreased 14.7% and preventable observation stays decreased 26.5% for all ages. Part of this decrease could be attributed to Medicare's change in outpatient reimbursement methodology. In 2002, Medicare began paying hospitals the same for observation stays and ED visits. This doesn't explain, however, why pre-

ventable observation stay rates decreased relative to total observation stay rates and why total observation stay and preventable observation stay rates decreased for payers other than Medicare.

Having health insurance does not equate to access to, or appropriate use of, high quality health care. Some payers, particularly Medicaid, had higher rates of preventable visits per population than the uninsured.

In FY02/FY03, blacks had the most PHs per 1,000 population (21.3) followed by whites (18.2), and Hispanics (12.6). The differences among races for preventable and total ED visits per 1,000 population were much greater. The preventable ED rate per 1,000 blacks was nearly two and a half times that of whites, and the rate for Hispanics was more than twice that of whites. A higher incidence of some preventable conditions among blacks and Hispanics may contribute to these differences, but many of the differences are likely due to blacks' and Hispanics' greater dependence on the ED for more of their health care needs. Blacks' and Hispanics' overall use of the ED (preventable and other) is also disproportionately higher than that of whites: roughly two and a half, and two, times higher, respectively.

The time of day that people visit the ED for an ambulatory care sensitive condition is very similar across races. Of five time periods within a day (midnight to early morning, early morning, day time, evening, and late evening), 40% to 44% (depending upon the race of patients) of ED visits for treatment of a preventable event occurred during the day. The next most frequent time was early evening, which accounted for 22% to 24% of preventable ED visits.

Small Area Analysis

Poorer areas in Massachusetts continue to be home to people who are hospitalized more frequently for preventable conditions. There was little variation among PH rates (per 1,000 population, age adjusted) in small areas between FY98/FY99 and FY02/FY03. Most areas that had relatively high PH

rates (for all ages) in FY98/FY99 experienced high rates again in FY02/FY03. Although declining PH and observation stay rates relative to total hospitalization and observation stay rates is good news, clearly there is considerable room for improving access to high quality primary care to Massachusetts residents.

Endnote for the Executive Summary

¹ These PH rates and those for the small area analyses (described later in this report) are age adjusted.

Foreword

Satisfying the Need for Health Care Information

The effectiveness of the health care system depends in part upon the availability of information. In order for this system to function properly, purchasers must have accurate and useful information about quality, pricing, supply and available alternatives. Providers need information on the productivity and efficiency of their business operations to develop strategies to improve the effectiveness of the services they deliver. State policy makers need to be advised of the present health care environment, as they consider where policy investigation or action may be appropriate.

As part of its health care information program, the Division publishes reports that focus on various health care policy and market issues.

The Division of Health Care Finance and Policy collects, analyzes and disseminates information with the goal of improving the quality, efficiency and effectiveness of the health care delivery system in Massachusetts. In addition, the Division administers the Uncompensated Care Pool, a fund that reimburses Massachusetts acute care hospitals and community health centers for services provided to uninsured and underinsured people.

Mission

To improve the delivery and financing of health care by providing information, developing policies, and promoting efficiencies that benefit the people of Massachusetts. Agency goals:

- Assure the availability of relevant health care delivery system data to meet the needs of health care purchasers, providers, consumers and policy makers;
- Advise and inform decision makers in the development of effective health care policies;
- Develop health care pricing strategies that support the cost effective procurement of high quality services for public beneficiaries; and
- Improve access to health care for low-income uninsured and underinsured residents.

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Preventable Hospitalization in Massachusetts: Update for FY02 and FY03

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Introduction

Preventable Hospitalization in Massachusetts: Update for Fiscal Years 2002 and 2003 is the fifth report by the Massachusetts Division of Health Care Finance and Policy (DHCFP) on preventable hospitalization in the Commonwealth.

Previous DHCFP Reports on PH

The initial publication, *Preventable Hospitalization in Massachusetts*, reviewed preventable hospitalization (PH) data for FY89 and FY90 and offered practical suggestions for applying the information. The second report, *Improving Primary Care: Using Preventable Hospitalization as an Approach*, examined the trends for FY92 and FY93, and described community initiatives that were implemented to reduce the rate of PHs. The third report, *Preventable Hospitalization in Massachusetts: Update for Fiscal Years 1995 and 1996* reviewed the new data and examined PH trends by type of condition, age, payer, insurance plan, and area. That publication also reported on the differences in PH rates between nursing facility and community residents. The fourth report built on the rich source of information from the third report and offered an insight into readmissions for ambulatory care sensitive conditions, and the use of observation stays by the health delivery system.

Preventable Hospitalization Report Methodology

Consistent with previous reports, most of the information in this report is an average of two years of data (FY02 and FY03) to increase statistical reliability.

PH trends examined in previous editions are updated, and for the first time, racial/ethnic characteristics are taken into consideration and presented. In addition, this update recognizes the importance of emergency department (ED) visits as a measure of access to care, and provides a snapshot of ED data for FY02 and FY03 by type of condition, age group, race/ethnicity, and payer.

What are Preventable Hospitalizations?

Preventable hospitalizations are defined as the inpatient treatment of ambulatory care sensitive (ACS) conditions for which timely and effective use of primary care should reduce the risk of hospitalization.² The ACS conditions examined in this report are based on a group of diagnoses initially compiled by John Billings and his colleagues at the United Hospital Fund of New York.^{3,4} The 24 ACS conditions used in this report are listed in Table 8 of the Appendix. This report also includes several additional disease categories that subsequently were identified by the US Health Resources and Services Administration,⁵ and Joel Weissman and his colleagues⁶ as being responsive to preventive services. Another DHCFP report, "Non-Emergent and Preventable ED Visits" Analysis in Brief, June 2004, employs a different definition of preventable ED visits, uses a different set of diagnoses, and incorporates factors such as urgency of visit.

Preventable hospitalization analysis is intended to help communities target opportunities for improving health care. In addition, during times that Massachusetts broadened or restricted the eligibility requirements of public health insurance for

children and low-income people, preventable hospitalizations attributable to free care should decline or increase respectively. This report may help measure the effectiveness of public programs in reducing hospitalizations.

Endnotes for the Introduction

- ² A complete discussion of “preventable hospitalizations” as a tool for analyzing, monitoring, evaluating and improving the delivery of health care services is provided in the first report.
- ³ Billings J. et al. Analysis of variation in hospital admission rates associated with area income in New York City. March 4, 1992 (Unpublished manuscript available from United Hospital fund of New York City).
- ⁴ Billings J. “Consideration of the use of small area analysis as a tool to evaluate barriers to access.” Health Resources and Services Administration. Consensus Conference on Small Area Analysis. DHHD Pub. No. HRS-A-PE-91-1(A). Washington: DHHS: 1990.
- ⁵ United States Department of Health and Human Services. National Heart, Lung and Blood Institute. National Institutes of Health, Bethesda, Maryland. *International Consensus Report on Diagnosis and Treatment of Asthma*. Publication No. 92-3091. June 1992.
- ⁶ Weissman JS, Gatsonis C, Epstein AM. “Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland.” *JAMA*. 1992;268:2388-2394.

Study Methods

This study uses retrospective encounter data to evaluate the rates and patterns of preventable health service utilization (i.e., preventable hospitalizations, preventable observation stays, and preventable ED visits) in the Commonwealth of Massachusetts. Massachusetts residents (i.e., those with a home address ZIP Code belonging to Massachusetts) who were hospitalized in a Massachusetts acute care hospital were included in this evaluation.

Individuals (regardless of place of residence) who used a Veterans Administration hospital in Massachusetts, Massachusetts residents who were hospitalized outside of Massachusetts, and people from out of state who utilized Massachusetts facilities were excluded from this analysis. This methodology is different from that used in past reports,⁷ and therefore, comparisons of utilization rates cannot be made across reports.

Data Sources

Outpatient Observation Stays and ED Visits

The data used in this report came from three sources of state-mandated encounter submissions. All acute care hospitals in Massachusetts are required to submit data for

all inpatient services, outpatient observation stays, and outpatient ED discharges to DHCFP on a quarterly basis. Two fiscal years of data (FY02 and FY03) were combined and averaged to yield the annualized rate that was used for most of the analyses in this report. Patients who were admitted to a hospital from either an observation stay bed or the ED were removed from the observation stay or ED file and reported only as inpatient stays. All three discharge files contain encounter-level information on each encounter, which includes admission and discharge status, demographic characteristics, diagnoses, dates of services, length of stay, procedures, charges, source of payment, and ZIP Code of residence.

EDs are an important setting for understanding the process that leads to preventable hospitalizations because 65% of patients who are hospitalized for an ACS condition are admitted through an ED. For the first time, the new DHCFP ED database, which consists of reports filed by Massachusetts acute care hospitals to DHCFP for FY02, was used to study the issue of preventable ED visits in Massachusetts.

Study Measures

Rates of Preventable Events

The main outcomes of interest include the rate of preventable hospitalizations, the rate of preventable observation stays, and the rate of preventable ED visits.

Annualized Rates of Preventable Events per 1,000 population.

Rates for PHs, preventable observation stays and preventable ED visits are calculated from two years of data that have been averaged to yield an annualized rate of

preventable events per 1,000 Massachusetts population. Two years of hospital discharge, observation stay and ED data were used in order to smooth out year-to-year fluctuations and increase the statistical reliability of the rates.

More important, however, are comparisons between preventable events and the corresponding total events. This helps to control for factors that could influence the trends in both preventable and total hospitalizations (THs). If viewed in isolation, for example, the 3% increase in preventable hospitalizations would trigger concern, but not necessarily in the context of a 5% increase in THs.

Number of Preventable Events as a Percentage of Total Number of Events.

The number of preventable events as a proportion of total events in FY02 and FY03 was calculated by dividing the average number of PHs, preventable observation stays, or preventable ED visits across the two years into the average total number of hospitalizations, observation stays or ED visits, respectively.

Examining the proportion of total events that are preventable is useful, particularly when comparing payers for whom we do not know the number of members. The impact of case mix variation among different payers is mitigated by the fact that the rates are calculated as the number of PHs for each payer divided by the number of THs for the corresponding payer. If differences in severity affect the numerator and denominator equally, the overall rates of PHs will be comparable across payers.

Length of Stay

A common measure of hospital resource use is length of stay. The average length of stay (ALOS) for both PHs and THs is compared to those of previous years to ascertain a trend over time.

Readmissions

As described in the previous (FY98/FY99) report, it is important to quantify the occurrence of hospital readmissions, i.e., the frequency with which individual patients are readmitted to the hospital for the same diagnosis. High readmission rates for ACS conditions are an indication that people are repeatedly having difficulty receiving adequate and high quality care. Identifying readmissions for specific conditions can be useful in targeting interventions to patients with the goals of improving patient quality of life, reducing multiple hospitalizations, and improving cost effectiveness.

Stratification

Age Group

To be consistent with the previous (FY98/FY99) report, patients were grouped into three categories by age: ages 0-17, ages 18 to 64, and ages 65 and older. By looking at preventable events in these age groups, it is possible to take into account several age-specific confounders in health services utilization and insurance coverage.

First, with the expansion of MassHealth in 1997, Medicaid began providing health care coverage to children of families who earn 150-200% of the federal poverty level (FPL). Indeed, a study by Kaestner et al. (2001), using the 1988 to 1992 National Inpatient Sample (NIS), found that Medicaid expansions decreased the incidence of ACS hospitalizations among children ages 2 to 6 from very low-income areas.⁸

MassHealth Basic coverage for adults with income up to 133% FPL who were considered long-term unemployed for more than one year, or earned too little to qualify for unemployment benefits, was discontinued on February 15, 2003 as part of state budget cuts. Finally, since most seniors have insurance through Medicare, poor access to primary care should be less of a barrier

among the elderly than among the non-elderly.

Moreover, people of different ages have different health needs. Those in the younger age groups often are not faced with the same medical conditions as those who are elderly; seniors often suffer from co-morbidities, which may exacerbate ACS conditions leading to an increased number of preventable events. Preventable event analysis in the different age groups is intended to reveal areas in which targeted interventions may reduce costs and improve health status.

Race

For the first time, preventable events are reported by race categories. Evaluations of preventable events by race allows for the identification of populations who are currently underserved in the primary care setting and are left to seek tertiary care in the ED setting or have delayed care until their conditions become serious enough to warrant hospitalization.

For example, other research suggests that blacks had disproportionately higher rates of hospitalization and ED visits for ACS conditions when compared with their white counterparts, and these differences could not be explained by disease prevalence or disease severity.^{9,10} Oster and Bindman (2003) also found that black patients were less likely to have follow-up arranged with the physician who made the ED referral,¹¹ thus, the higher rates of PHs may be associated with the lack of access to outpatient medical care resulting in the deterioration of health.

To provide adequate numbers in each category for comparisons, race and ethnicity in this report have been categorized as white, black, Hispanic, other (e.g., Asians, Native Americans, and others), and Unknown.

Type of Payer

Examining the proportion of total events that are preventable enables one

to compare payers' successes or failures in containing preventable events. Payer types are divided into nine categories: commercial, HMOs, preferred provider organizations (PPOs), point of service (POS) plans, Medicare managed care organizations (MCOs), Medicare, Medicaid MCOs, Medicaid Primary Care Clinician (PCC)¹² and the uninsured. Payers that did not fit into one of these categories (i.e., other payers) are not presented in the main report, but are included in Table 6 in the Appendix of this report.

Small Areas

Consistent with previous PH reports by the Division of Health Care Finance and Policy, Massachusetts ZIP Codes were grouped into small areas for analysis. Small area analysis provides a way of tracking preventable events across the state by geographic locations, and allows for the identification of areas with the most vulnerable populations in need. US Postal Service ZIP Codes were grouped, if necessary, into larger PH ZIP Codes to ensure a sufficient population count of at least 5,000 people for each small area. The PH rates (per 1,000 population) for all ages are age-adjusted to account for the variation in the number of elderly who have a disproportionate number of PHs.

The age adjustment method has been changed since the previous (FY98/FY99) report. As a result, age-adjusted rates from this report are not comparable to age-adjusted rates in previous Preventable Hospitalization reports, which were adjusted according to age distributions in Massachusetts. However, the new age-adjusted rates are comparable to rates reported in national literature that uses the updated national age distributions based upon the 2000 census projections.

Time of ED Visit

The Division of Health Care Finance and Policy's ED data includes the time of

each visit. It is helpful to identify the time of day in which services are provided. In particular, the prevalence of visits at certain times of the day, by specific age groups, and race, may suggest different health care access needs.¹³

A high prevalence of ED visits in the evening may suggest a need for extended primary care hours, while a high prevalence of visits during regular office hours could suggest over-scheduled primary care practices. For example, using a national sample survey of ED visits, Weinick et al. (2003) found an increased likelihood of ACS ED visits among children between midnight and 9:00 a.m. and on weekends, perhaps suggesting that after-hours clinics may be helpful in reducing ACS ED visits among children.¹⁴ Some

people, however, may continue to use the ED for non-urgent care regardless of the accessibility of primary care.

Data Analysis

All analyses for this evaluation were descriptive in nature. Rates of each type of preventable event were calculated as a proportion of the total number of those events, as well as events per 1,000 population. Trend analysis was shown by recalculating previously reported numbers¹⁵ in order to make the methodologies consistent for all years being compared. Preventable events also were evaluated based upon age groups, type of payer, race and (for preventable hospitalizations only) small area distributions.

Endnotes for Study Methods

⁷ Previous reports included Massachusetts residents hospitalized in Massachusetts V.A. hospitals and Massachusetts residents who were hospitalized in contiguous states.

⁸ Kaestner R, Joyce T, Racine A. "Medicaid eligibility and the incidence of ambulatory care sensitive hospitalizations for children." *Social Science and Medicine*. 2001; 52:305-313.

⁹ Pappas G et al. "Potentially avoidable hospitalizations: inequalities in rates between US socioeconomic groups." *American Journal of Public Health*. 1997; 87:811-816.

¹⁰ Oster A, Bindman AB. "ED visits for ambulatory care sensitive conditions." *Medical Care*. 2003; 41:198-207.

¹¹ Ibid.

¹² The Medicaid PCC program is administered by the Massachusetts Department of Medical Assistance and is regarded as a managed care plan.

¹³ Weinick RM, Billings J, Thorpe JM. "Ambulatory care sensitive ED visits: a national perspective." *Academic Emergency Medicine*. 2003; 10(5):525-526.

¹⁴ Ibid.

¹⁵ Massachusetts Division of Health Care Finance and Policy. *Preventable Hospitalization in Massachusetts: Update for FY98 and FY99*. February 2002.

Highlighted Study Results

true for all ages (see Figure 1), people ages 0-64 (see Figure 2) and people ages 65 and older (see Figure 3). Decreasing PHs relative to total acute care hospitalizations may be good news from an access point of view, but increasing acute care hospitalizations may have an adverse effect on total costs. The Division of Health Care Finance and Policy examines possible causes for the increasing trend in THs in a different report.¹⁶

A more unusual trend has been the decrease in the number of observation stays, both total and preventable. From FY98/FY99 to FY02/FY03, total observation stays for all ages decreased 16.0% and preventable observation stays decreased 26.5% (see Figure 1). The decreasing trend for total observation stays and steeper decline for pre-

Trends in Total and Preventable Events per 1,000 Population

From FY98/FY99 to FY02/FY03, preventable hospitalizations (PHs) per 1,000 population increased (3%), but not as much as THs at 4.9%. Therefore, PHs decreased relative to THs. The relative decrease was

Percent Change in Utilization per 1,000 Population for All Ages: FY98/FY99 to FY02/FY03

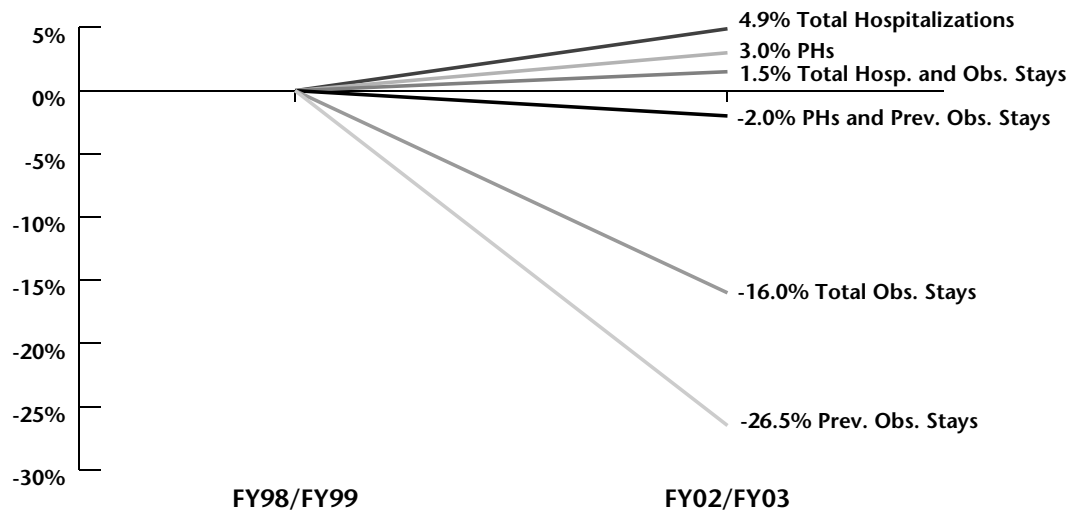


Figure 1

From FY98/FY99 to FY02/FY03, the rate of PHs for all Massachusetts residents increased (3%), but not as much as for THs (almost 5%). In contrast, the rate of total observation stays plunged (-16%) and the rate of preventable observation stays plummeted even more (-26.5%). The net effect on the rate of preventable events was a 2% decline.

ventable observation stays was true for each of the age groupings (ages 0-64, see Figure 2, and ages 65 and older, see Figure 3). The substantial decrease in observation stays lies in stark contrast to the steady increase in observation stays during the mid- to late 1990s.¹⁷ Part of this decrease, at least for the elderly, is likely due to Medicare's change in outpatient reimbursement methodology. In 2002, Medicare began paying hospitals the same amount for observation stays and ED visits, eliminating any financial incentive to classify patients as observation stay patients. This doesn't explain, however, why preventable observation stay rates decreased relative to total observation stay rates, nor why total observation stay rates and preventable observation stay rates decreased for payers other than Medicare.

The Division learned that some Massachusetts HMOs have modified their admis-

sion criteria resulting in fewer observation stays and likely more admissions (see Discussion section). The steeper decrease in preventable observation stays, compared to total observation stays could be a bright point from the perspective of access to care. This supports the possibility that access to good quality health care may be improving, although other events may be compensating for the relative decrease in preventable observation stays. It is possible, for example, that preventable ED visits increased disproportionately while preventable observation stays decreased. The accumulation of ED visit information in the future may shed light on the interplay among hospital admissions, observation stays, and ED visits.

Preventable ED Visits

For preventable ED visits,¹⁸ children had the highest rate at 64.9 cases per 1,000

Percent Change in Utilization Rates per 1,000 Population for Ages 0-64: FY98/FY99 to FY02/FY03

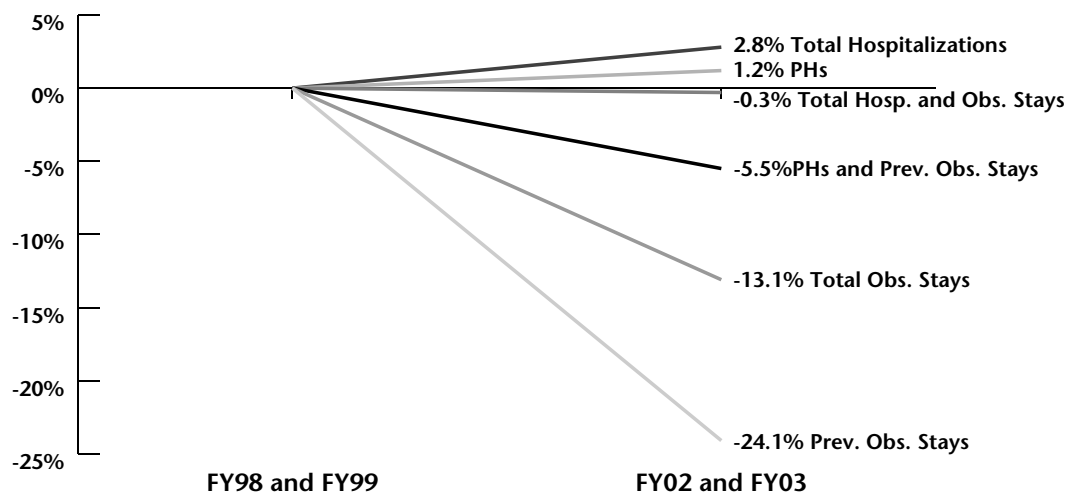


Figure 2

Trends from FY98/FY99 to FY02/FY03 for those ages 0 to 64 was very similar to that for all ages, but the changes were tempered: the PH rate increased a slight 1.2%, while the TH rate increased 2.8%. The total observation stay rate declined more than 13%, while the rate for preventable observation stays plunged more than 24%. The net effect on the rate of preventable events was a 5.5% decline.

Percent Change in Utilization Rates per 1,000 Population for Ages 65 and Older: FY98/FY99 to FY02/FY03

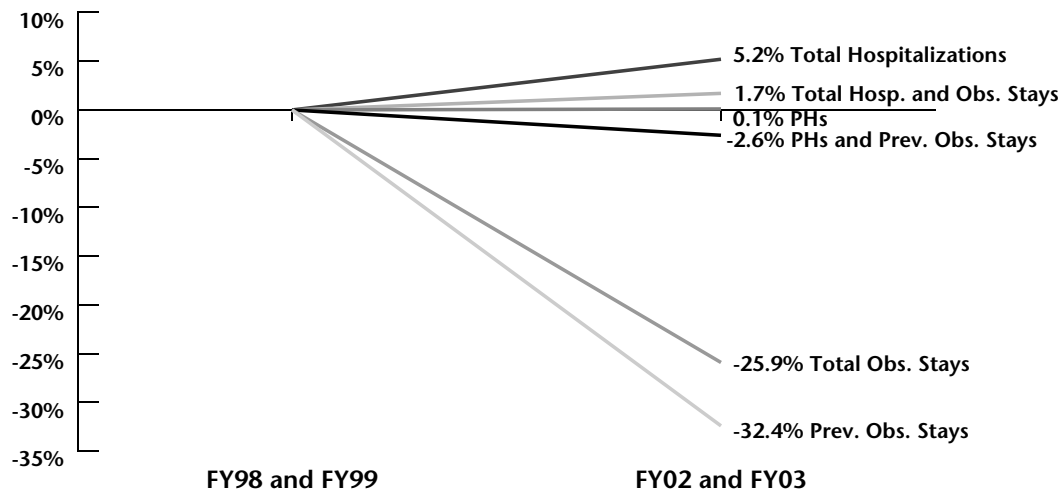


Figure 3

From FY98/FY99 to FY02/FY03, the PH rate for the elderly remained virtually flat (+ 0.1 %), while their TH rate increased more than 5%. The elderly experienced the most dramatic percent decrease in rates of observation stays of any population, likely as a result of a change in Medicare reimbursement policy. The overall effect on total and preventable events was quite small (decrease of 2.6%), however, since the number of observation stays was relatively few for the elderly especially compared to their number of hospital admissions.

population, followed by working-age adults at 45 cases per 1,000, and the elderly at 42.7 cases per 1,000 population. Figure 4 shows that children visit the ED nearly 10 times as frequently as they are admitted to a hospital, while the ratio for people ages 18 to 64 falls to five to one. The ratio reverses with the elderly who are admitted a little less than two times as often as they visit an ED. All ED visits that result in a patient being triaged to a higher level of care is recorded only as an admission. Patients who are admitted or recorded as an observation stay patient through the ED do not appear in the ED file.

Length of Stay

The average length of stay (ALOS) in FY02/FY03 was nearly the same for THs (4.3) and PHs (4.2).¹⁹ The difference narrowed from FY98/FY99 when the ALOS was 4.9 days for THs and 4.1 days for PHs.

Admissions and Readmissions

Between FY98/FY99 and FY02/FY03, PHs decreased for some ACS conditions and increased for others. Among the top ten conditions by volume, rates of PHs per 1,000 population improved (i.e., decreased) only for COPD, CHF and bacterial pneumonia (see Table 1 in the Appendix). Among the remaining top seven ACS conditions whose rates increased, the percent increase exceeded 10% (from 10.5% to 22.2%) for four conditions: diabetes, gastroenteritis, dehydration and cellulitis.

Figure 5 shows admissions and readmissions for four ACS conditions in which a high number of readmissions occurred. COPD was responsible for the highest number and proportion of readmissions (22%) among working-age adults. For the elderly, CHF accounted for more than half the number of readmissions for bacterial

Rates of Preventable Events in Massachusetts per 1,000 Population by Age and Type of Event: FY02/FY03

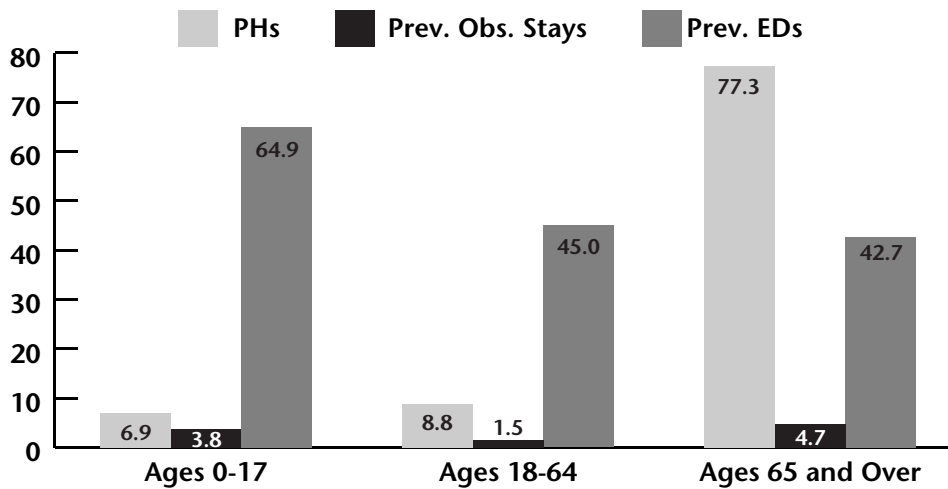


Figure 4

In FY02/FY03, the likelihood of people being hospitalized for a preventable event increased substantially with age while the likelihood of visiting an ED for a preventable event decreased with age.

PH Readmissions in Massachusetts by Age Group and Selected Conditions: FY02/FY03

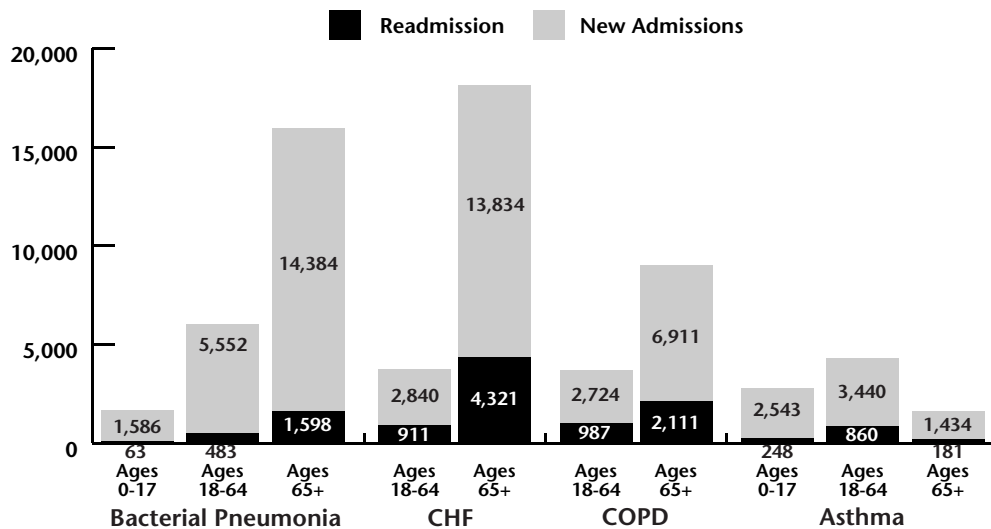


Figure 5

Readmissions occur more frequently among the elderly than among other age groups. Congestive heart failure (CHF) PHs among the elderly are responsible for the highest number and percent of readmissions. COPD among the elderly is second in both number and percent of readmissions and only half the number of readmissions for CHF. Conditions with high readmission rates represent opportunities to reduce PHs with interventions to fewer patients.

Change in the Proportion of Readmissions to Total PH Admissions in Mass. by Age Group and Selected Conditions: FY98/FY99 to FY02/FY03

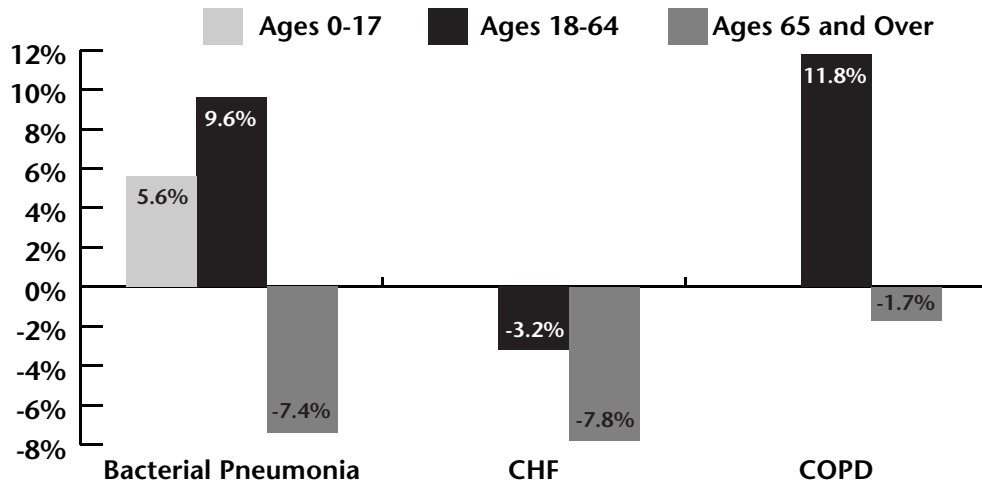


Figure 6

Readmission rates for some people with an ACS condition have increased while readmission rates for other people with same the condition have decreased, depending upon the age group.

pneumonia, COPD, asthma and CHF combined.

Between FY98/FY99 and FY02/FY03, readmission rates for bacterial pneumonia, CHF and COPD fell for the elderly (see Figure 6). The elderly's declining readmission rates for bacterial pneumonia and COPD contrast with increasing readmission rates for people ages 18 to 64. See Tables 1 through 6 in the Appendix for rates of PHs and preventable observation stays by top ten ACS conditions by age group for FY98 through FY03.

Payer Type

Figure 7 shows the proportion of total events (hospitalizations, observation stays, and ED visits) that are preventable across payer types. For PHs, both Medicare MCO and Medicare non-managed care patients had the highest proportion of PHs (20% and 22%, respectively). Medicare has tradition-

ally experienced the highest ratio of PH to THs at least in part because most of its beneficiaries are elderly and suffer from more co-morbidities than the non-elderly.

Excluding the two categories of Medicare payers for the reason described above, the uninsured, understandably, have the highest proportion of PHs (see Figure 7). Yet the uninsured have a lower ratio of preventable to total ED visits than any of the nine payer types except commercial insurers. The ratio of preventable to total ED visits is not a good access measure for the uninsured. For more detailed information on preventable ED visits see the June 2004 DHCFP report: "Non-Emergent Preventable ED Visits," *Analysis in Brief*, Number 7.

Payer Type and Observation Stays

When patients are sick enough to need monitoring by a clinician, but not sick

enough to meet admission criteria, observation stays are often employed. Observation stays are less expensive alternatives to hospitalizations and the use of observation stays varies by payer. Viewing preventable observation stays as a proportion of PHs plus observation stays may serve as a proxy to evaluate which payer types are more likely to use outpatient observation stays.

Earlier in this section, the substantial decrease in total, and in particular, preventable observation stays is discussed. Data from FY98/FY99 and FY02/FY03 show decreases in the proportion of observation stays for every payer except commercial insurers (whose use of preventable observation stays increased slightly). Changes in the use of observation stays varied among other providers (see Figure 8). Payers with the most noticeable decreases included Medicare, the uninsured, and point of ser-

vices plans. Medicare, which created observation stays as a payment category in the late 1980s, is by far the least likely payer to use preventable observation stays. Prior to 2002, Medicare's use of observation stays was already considerably lower than that of other payers and Medicare's change in reimbursement policy in 2002 undoubtedly contributed to the disproportionate decline in Medicare's use of observation stays since 2002.

Rates of Preventable Events by Race

To understand how the distribution of health services utilization compares to the overall racial/ethnic make-up of Massachusetts, it is necessary to calculate a standardized rate for effective comparisons. Preventable events per 1,000 population, based on specific racial/ethnic categories, are presented in Figure 9. In FY01 and

Preventable Events in Massachusetts as a Percentage of their Respective Total Events by Payer Type: FY02/FY03

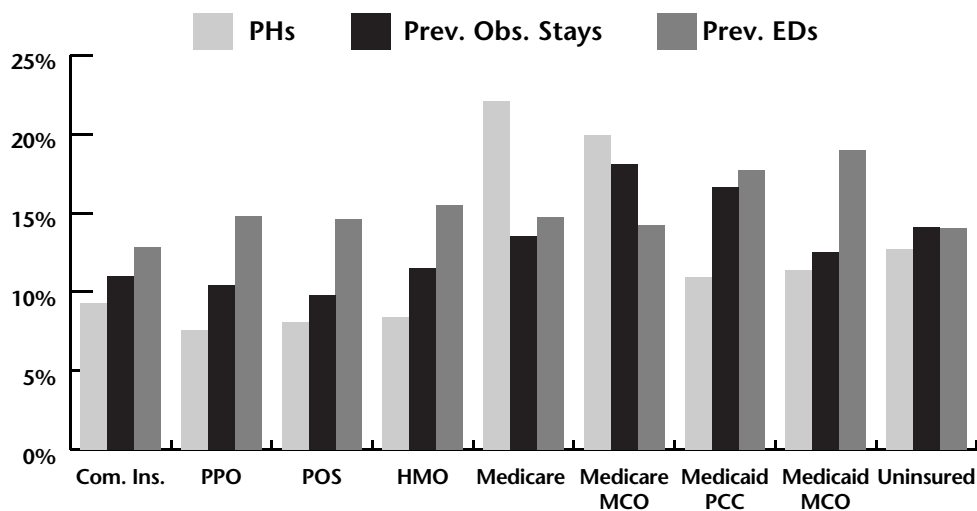


Figure 7

Preventable events by payer did not bear out assumptions that “managed” health care plans provide better access to care, which should be reflected in lower PH rates. There was little variation in the proportion of hospitalizations that were preventable among types of plans.

Preventable Observation Stays in Massachusetts as a Percentage of PHs by Payer for All Ages: FY98/FY99 and FY02/FY03

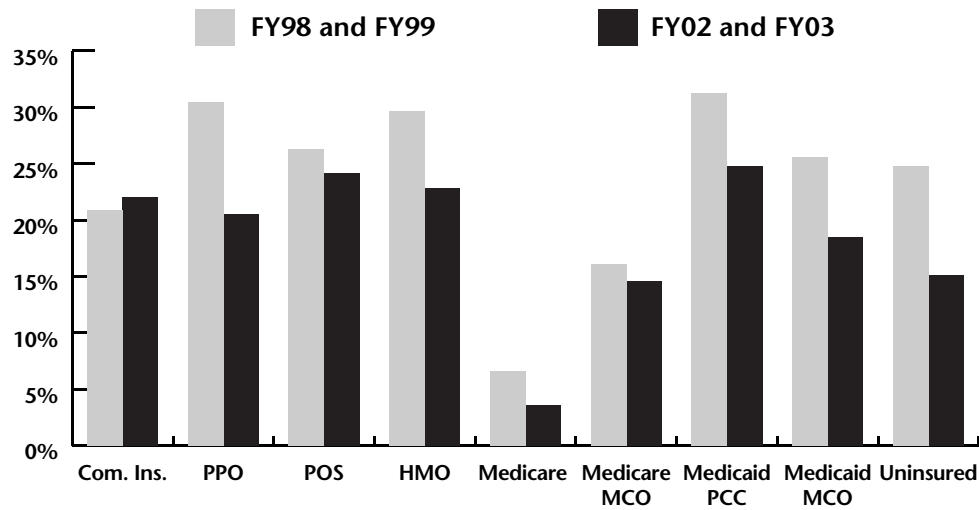


Figure 8

Observation stays, as a percent of PHs, plummeted for most types of payers with Medicare leading the way. Only commercial payers increased their use of preventable observation stays relative to PHs.

FY02, blacks had the highest rates of all preventable events in Massachusetts. For example, in terms of PHs, blacks had 21 cases per 1,000 population, followed by whites (18 cases per 1,000 population), Hispanics (13 cases per 1,000 population), and other races (6 cases per 1,000 population). However, the most dramatic discrepancies in preventable event rates among these populations are apparent when studying preventable ED visits.

Blacks and Hispanics had more than two times the rate of preventable ED visits than whites (101 and 94 cases per 1,000 population compared to 42 cases per 1,000 population), and more than three times the rate when compared to “other races” (30 cases per 1,000 population). This difference, however, reflects the total ED use rates among races because total ED visits for blacks and Hispanics are also

roughly double the rate of total ED visits for whites.

Analyses of preventable events by race and ethnicity showed that, as a proportion of inpatient discharges, whites and blacks were the most likely to have a PH, with 16% of their THs attributable to an ACS condition (see Figure 10). Blacks had the highest proportion of preventable observation stays (17%), followed by Hispanics (15%), and other races (13%). In terms of all ED visits, Hispanics were the most likely to have visited the ED for an ACS condition (18%) when compared to blacks (16%), other races (14%), and whites (13%).

Time of ED visits

Finally, identifying the time of ED visits by age and race may help elucidate patterns of unmet needs (see Figure 11). For all age groups, the majority of visits were

Rates of Preventable Events in Massachusetts per 1,000 Population by Race and Type of Event: FY02/FY03

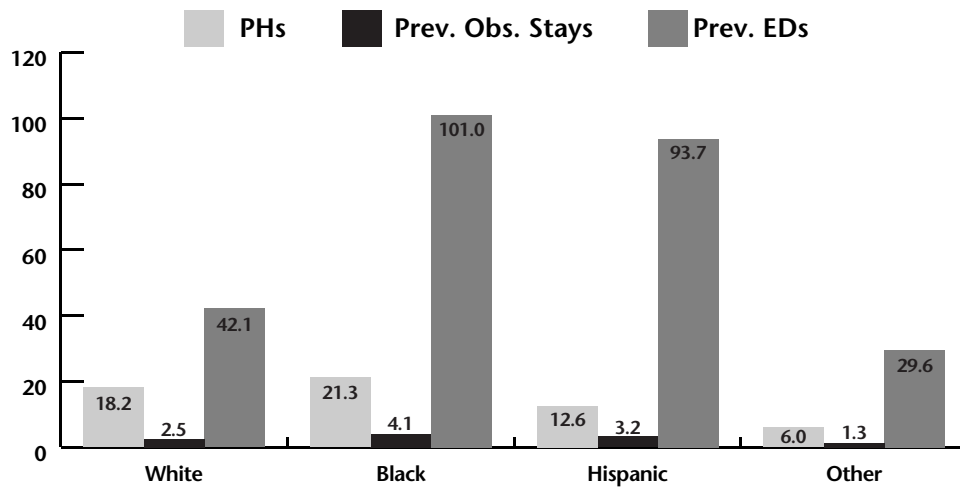


Figure 9

PH rates per 1,000 population for whites were less than that of blacks and higher than that of Hispanics but blacks and Hispanics' rates of preventable ED visits were more than twice that of whites.

conducted between the hours of 9 a.m. and 5 p.m., followed by evening, with most of the elderly (73%) visiting the ED throughout these hours. Compared to the other age groups, children were the most likely to use the ED during non-office hours, as seen from 5 p.m. to 6 a.m. in the morning. In terms of race, there seems to be very little difference among the groups with regard to the time of day an ED visit was made (see Figure 12).

Small Area Analysis

Figures 13 to 28 depict variations of PH rates across Massachusetts and in greater detail for the three largest urban areas: Boston, Springfield, and Worcester. Table 7 in the Appendix shows the average annualized rates of PHs for each of the 357 small areas in Massachusetts for FY02/FY03. Four maps of PH rates are presented for each area: all ages, ages 0 to 17, ages 18 to 64, and ages

65 and older. The PH rates for the "all ages" maps are the only maps for which the data is age-adjusted.

As an indication of relative performance, each small area is expressed in terms of how far its PH rate is from the average across all small areas. The small areas are divided into three groups: 1) those with PHs less than the average of the small areas, 2) those with PH rates equal to the average and up to one standard deviation above the average, and 3) those small areas with PH rates equal to one standard deviation above the average or higher.

The distribution of PHs for all ages and each of the three sub-groups (0-17, 18-64, and 65+) in Massachusetts has remained relatively unchanged among the small areas since FY98/FY99 (see Figures 13 to 16). The highest PH rates are still concentrated in the three largest urban areas: Boston (see

Preventable Events in Massachusetts as a Percentage of Total Events by Race and Type of Event: FY02/FY03

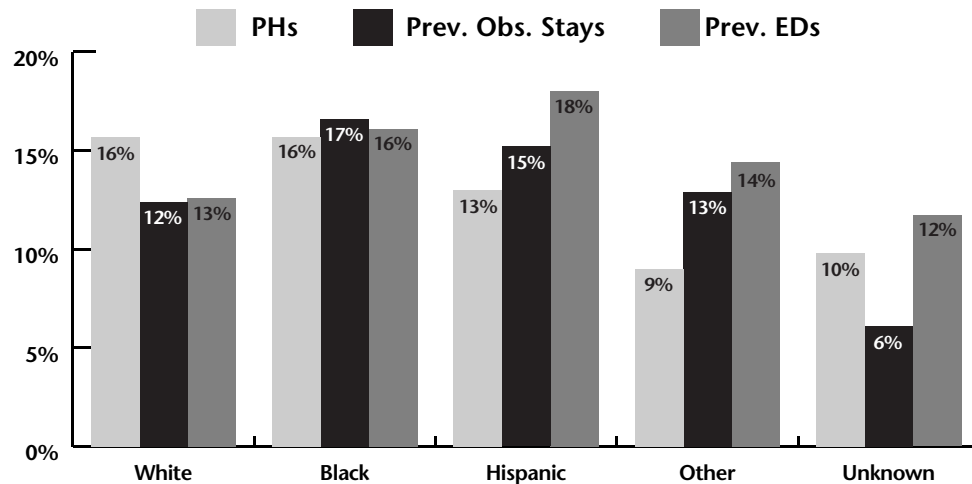


Figure 10

The proportion of total events (hospitalizations, observation stays, and ED visits) that were preventable did not vary by race nearly as much as preventable utilization rates per 1,000 population (Figure 9). Clearly, blacks and Hispanics use the ED as a regular source of care far more than whites which in itself suggests worse access for black and Hispanic.

Time of Preventable ED Visits by Age: FY02/FY03

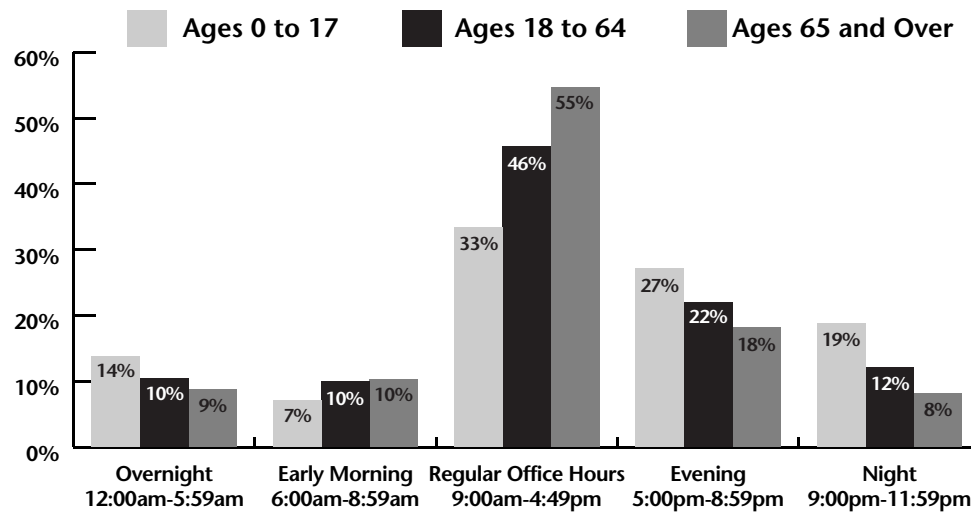


Figure 11

Children are the least, and the elderly are the most, likely to seek ED care for a preventable condition during regular office hours or hours close to regular office hours (early morning and early evening).

Time of ED Visits by Race: FY02/FY03

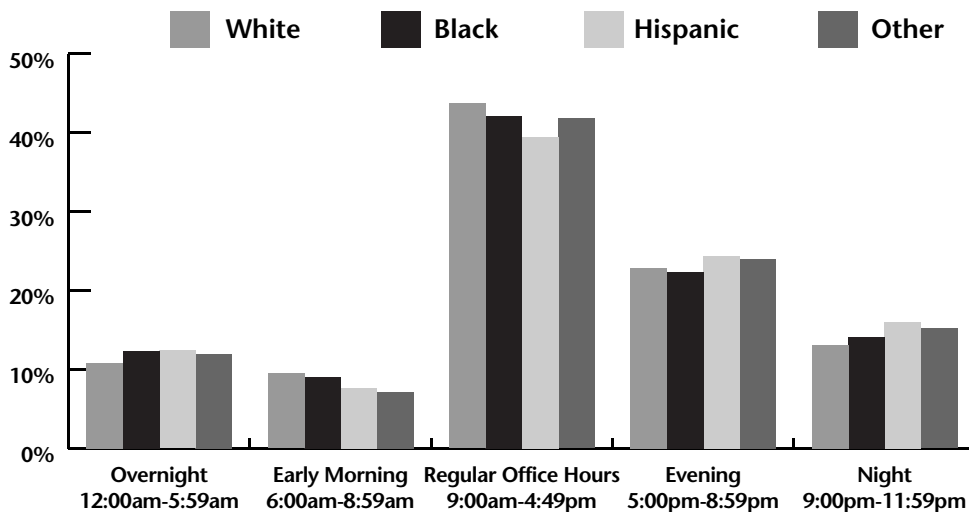


Figure 12

There is very little variation in the time of visit to an ED for a preventable condition based upon race.

Figures 17 to 20), Worcester (see Figures 21 to 24), and Springfield (see Figures 25 to 28). Although maps of PH rates from the previous report (PH update for FY98/FY99) are

not pictured in this report, rarely does the PH rate within a small area change from the highest category to the lowest or vice versa over this time span.

Endnotes for Highlighted Study Results

¹⁶ Division of Health Care Finance and Policy. "Massachusetts Inpatient Hospital Trends." *Analysis in Brief*. Number 6, April 2004.

¹⁷ Ibid.

¹⁸ "Preventable ED visits" in this report are defined as ED visits for an ACS condition. Another report published by the DHCFP: "Non-Emergent and Preventable ED Visits," *Analysis in Brief*, Number 7, June 2004, employs a different definition of preventable ED visits.

¹⁹ Both preventable and total ALOS figures exclude outliers.

Preventable Hospitalizations in Massachusetts FY02/FY03, All Ages

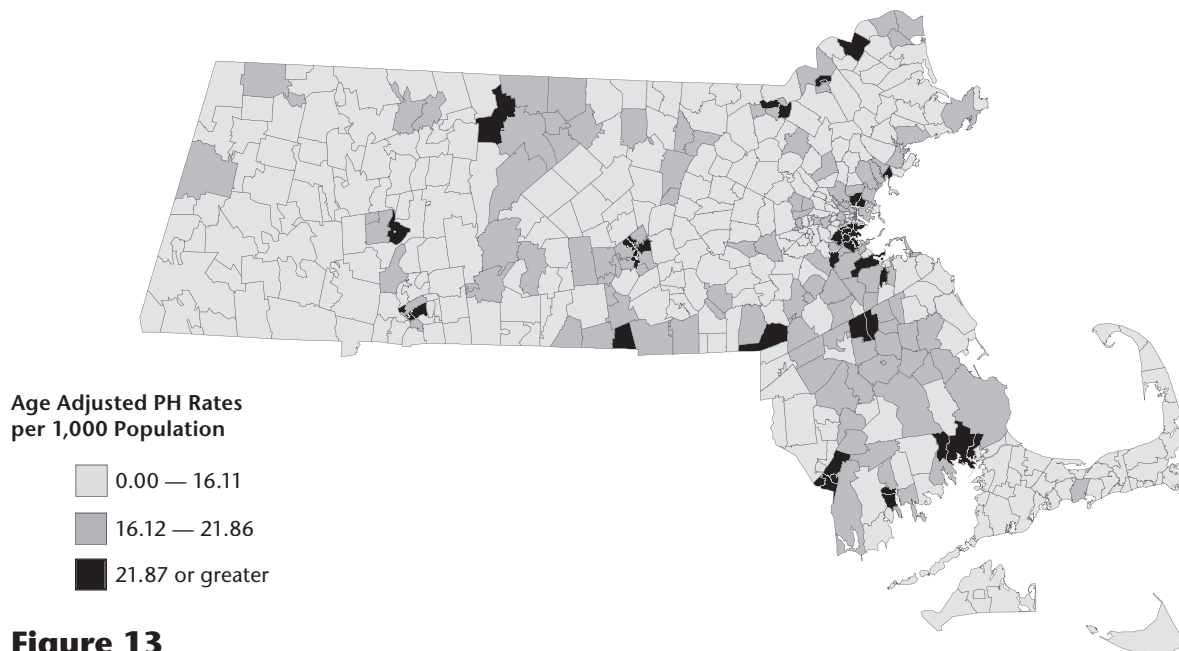


Figure 13

Preventable Hospitalizations in Massachusetts FY02/FY03, Ages 0-17

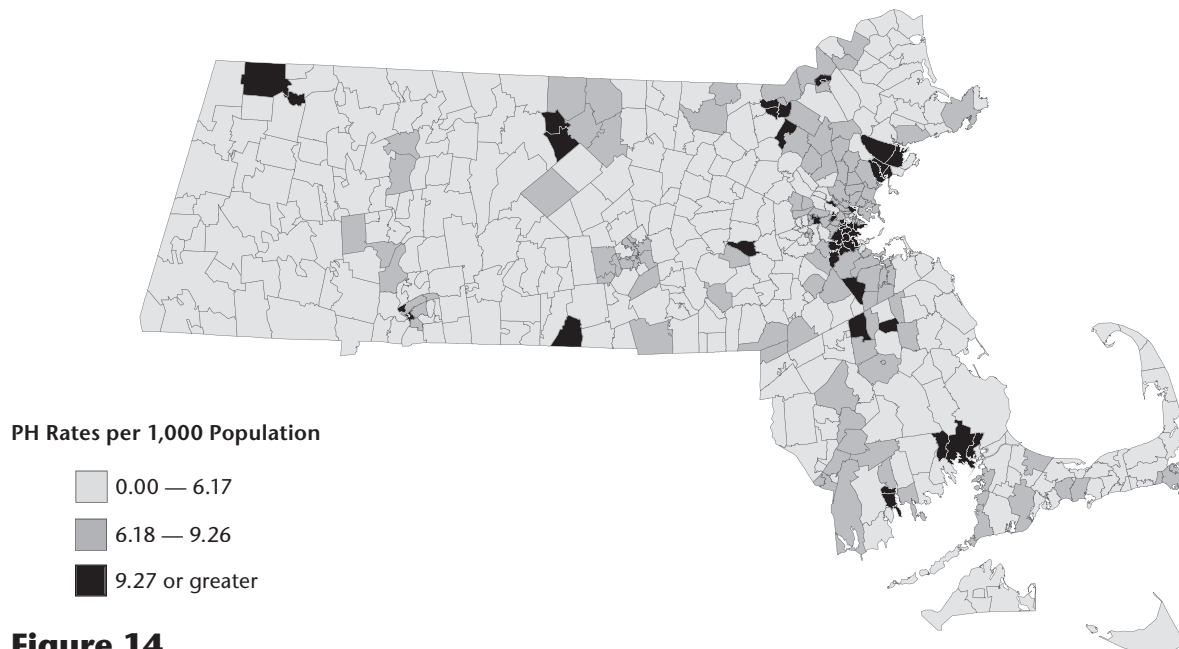


Figure 14

Preventable Hospitalizations in Massachusetts FY02/FY03, Ages 18-64

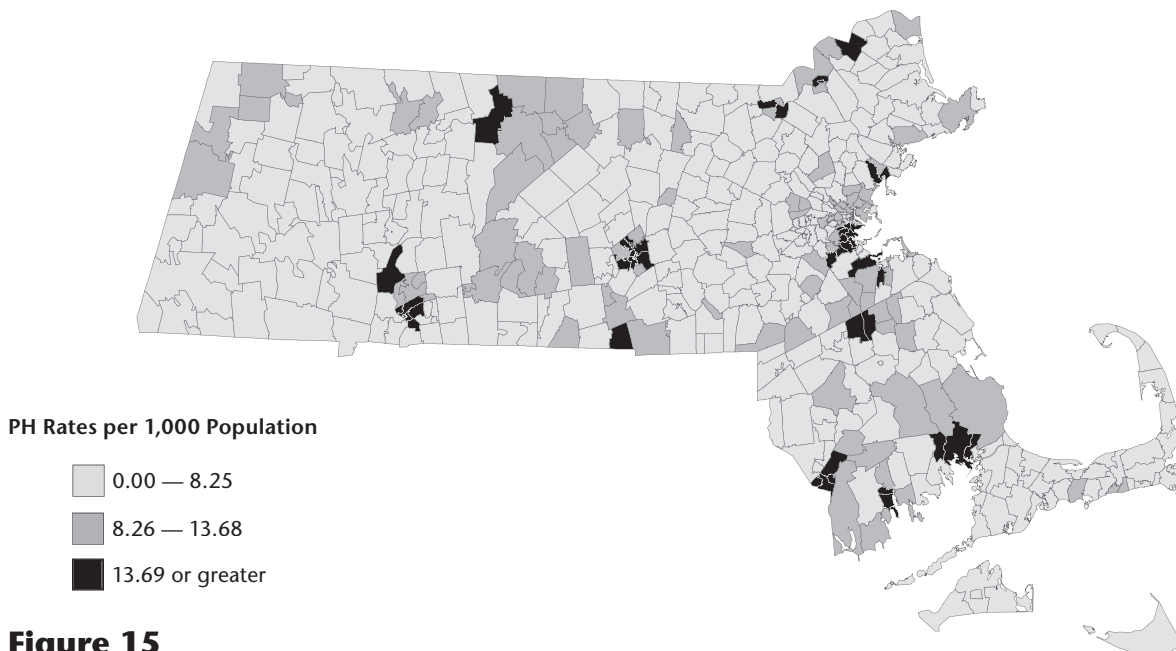


Figure 15

Preventable Hospitalizations in Massachusetts FY02/FY03, Ages 65 and Older

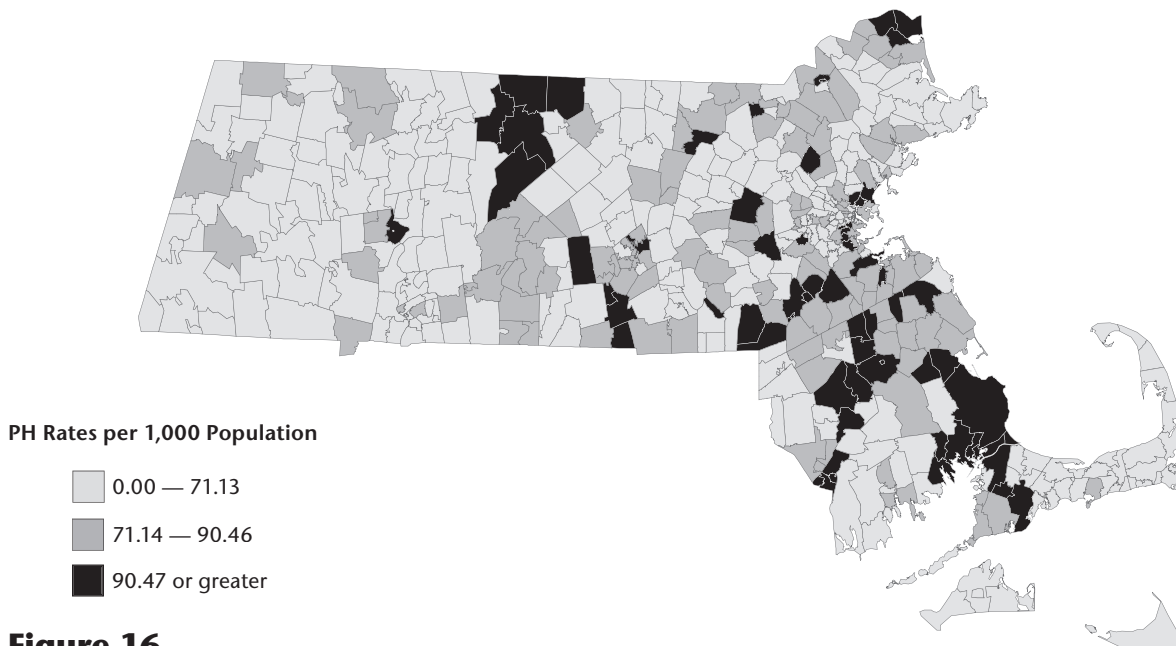


Figure 16

Preventable Hospitalizations in Boston FY02/FY03, All Ages

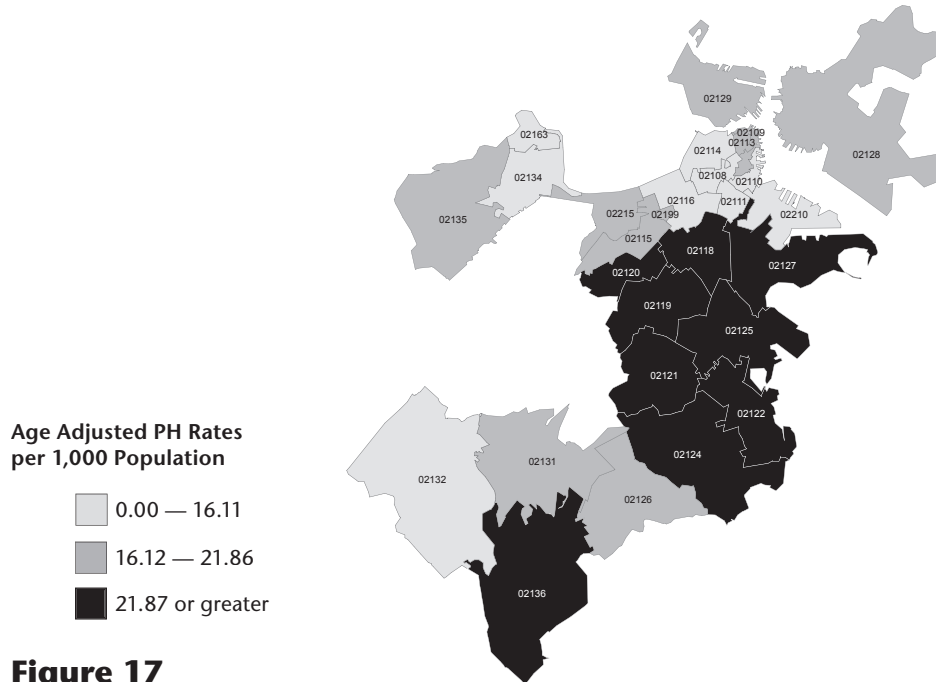


Figure 17

Preventable Hospitalizations in Boston FY02/FY03, Ages 0-17

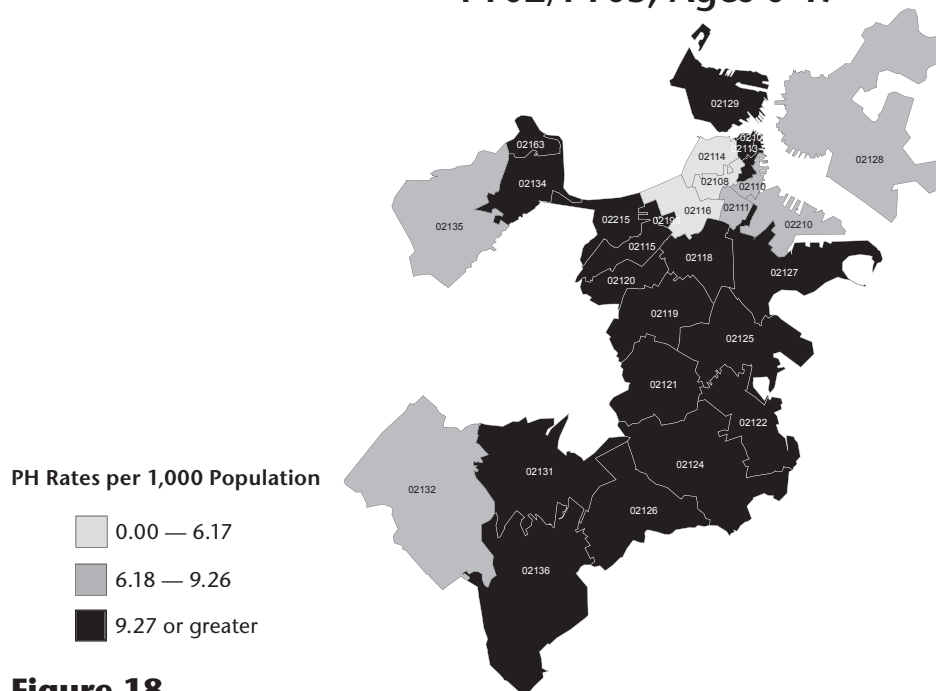


Figure 18

Preventable Hospitalizations in Boston FY02/FY03, Ages 18-64

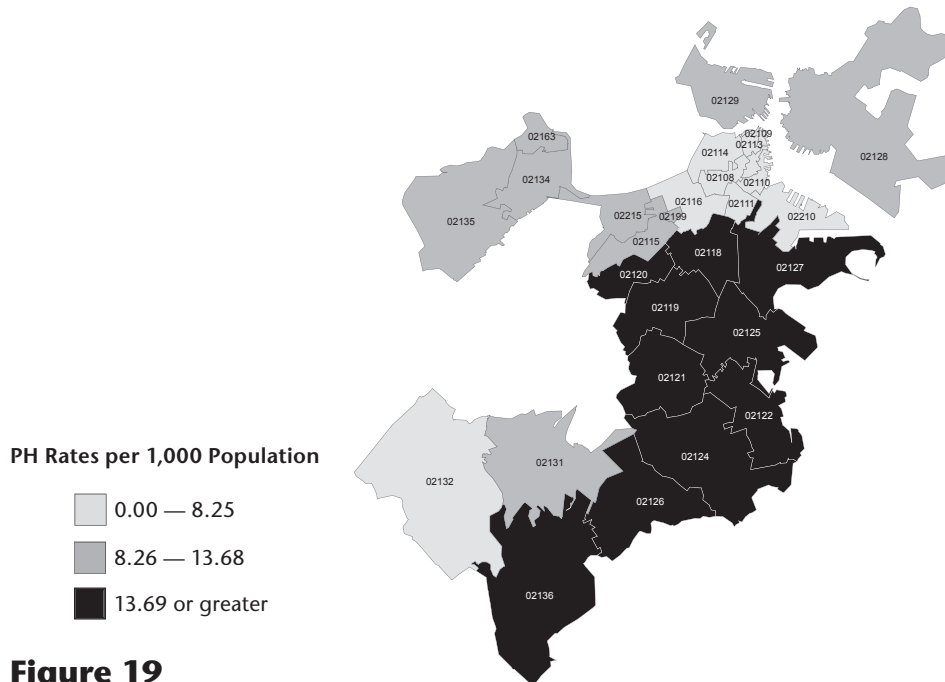


Figure 19

Preventable Hospitalizations in Boston FY02/FY03, Ages 65 and Older

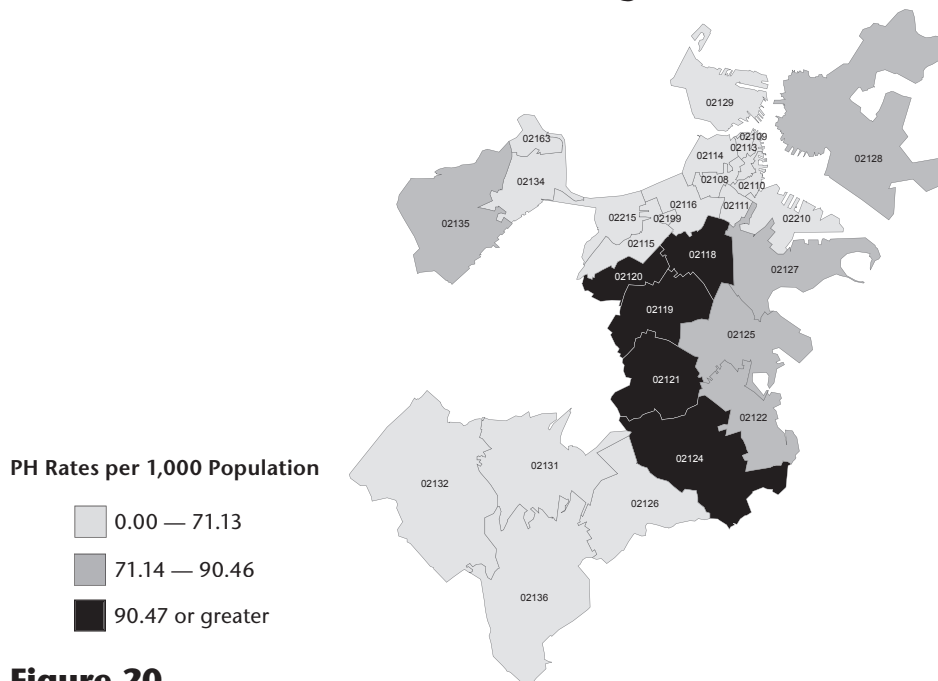


Figure 20

Preventable Hospitalizations in Springfield FY02/FY03, All Ages

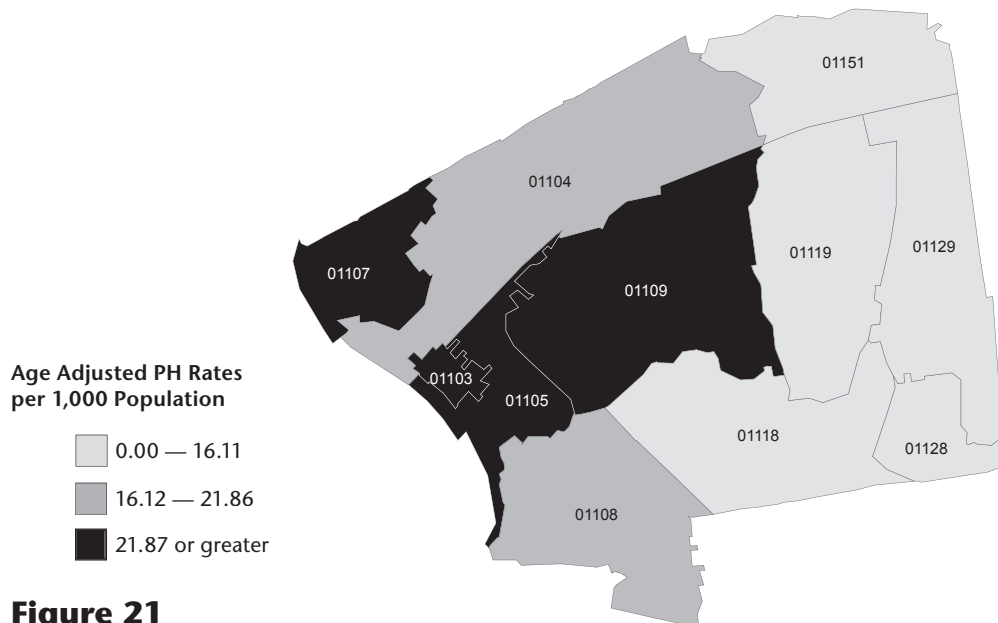


Figure 21

Preventable Hospitalizations in Springfield FY02/FY03, Ages 0-17

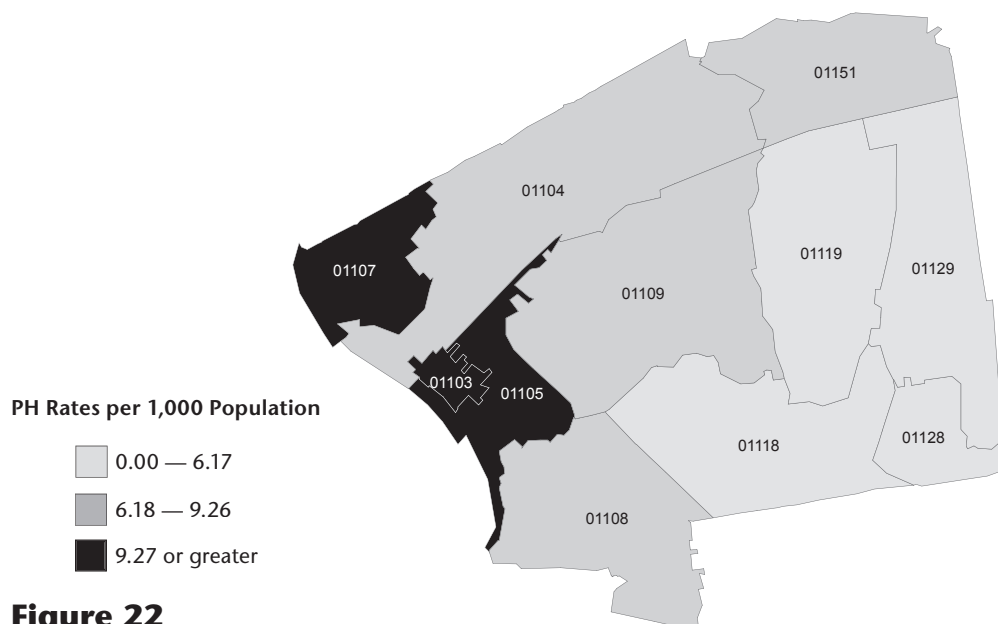


Figure 22

Preventable Hospitalizations in Springfield
FY02/FY03, Ages 18-64

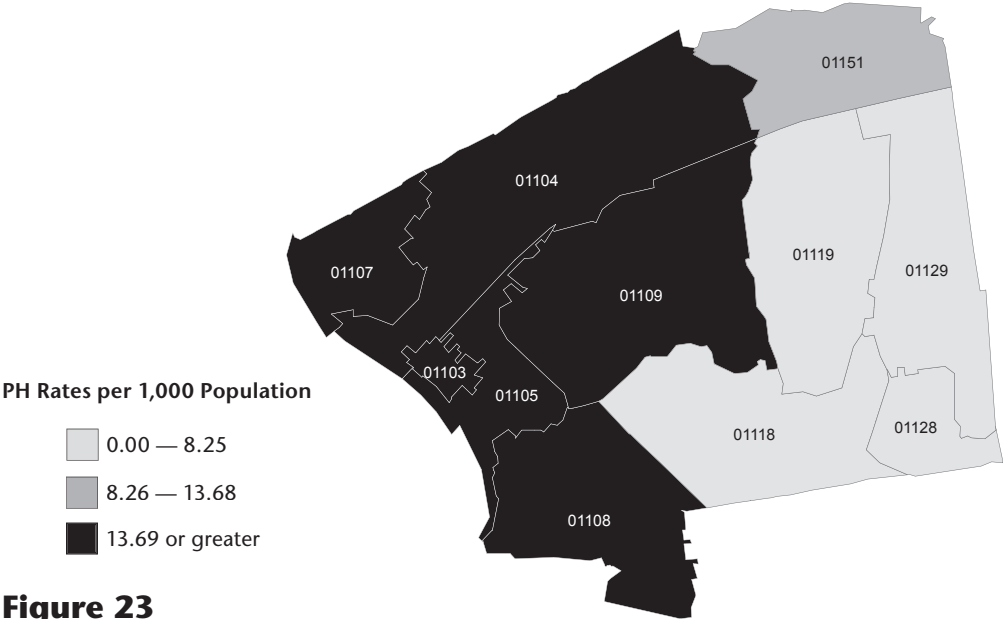


Figure 23

Preventable Hospitalizations in Springfield
FY02/FY03, Ages 65 and Older

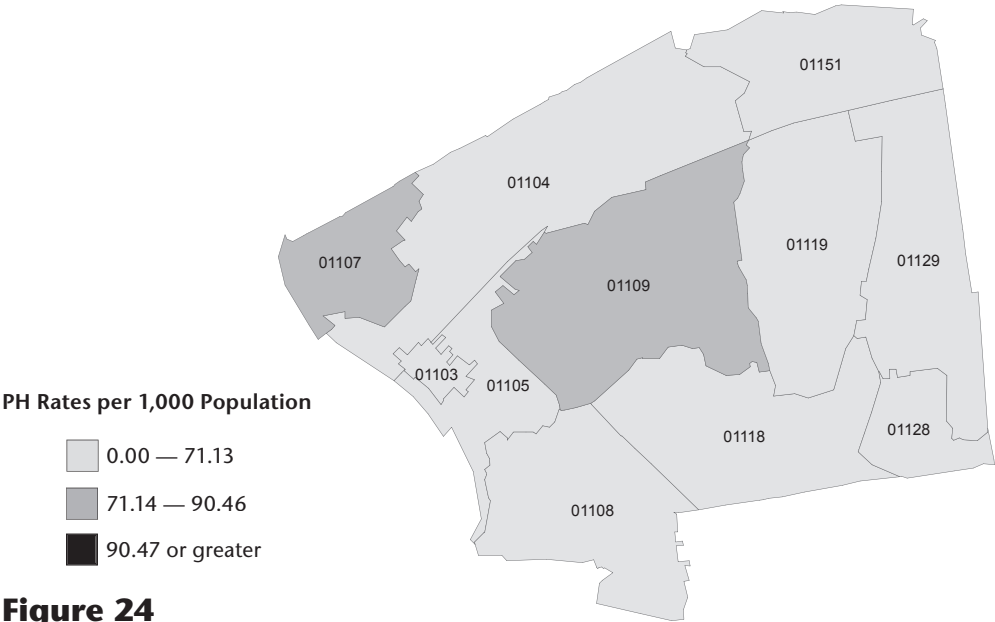


Figure 24

Preventable Hospitalizations in Worcester FY02/FY03, Age Adjusted for All Ages

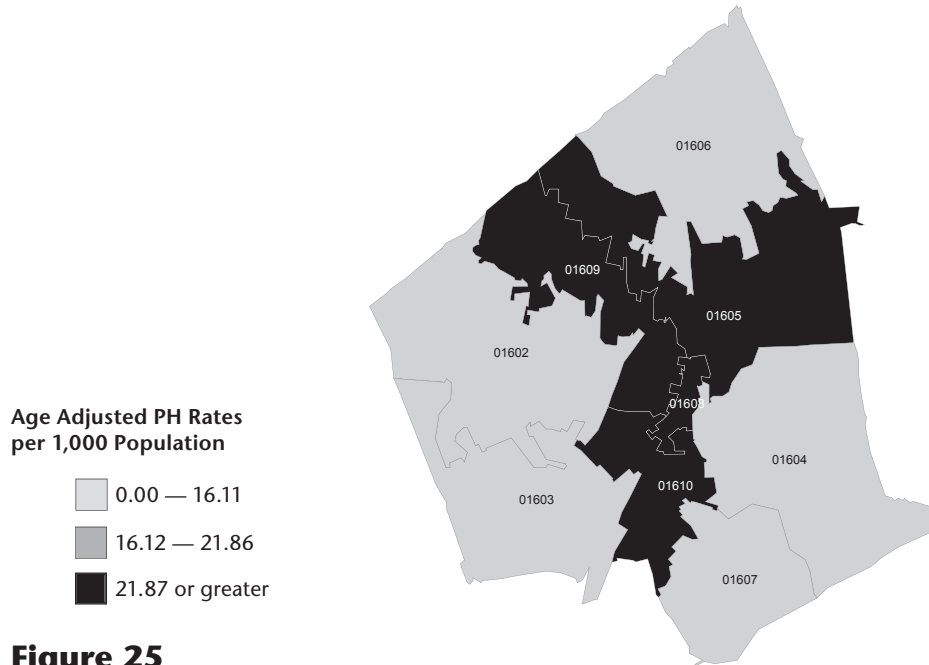


Figure 25

Preventable Hospitalizations in Worcester FY02/FY03, Ages 0-17

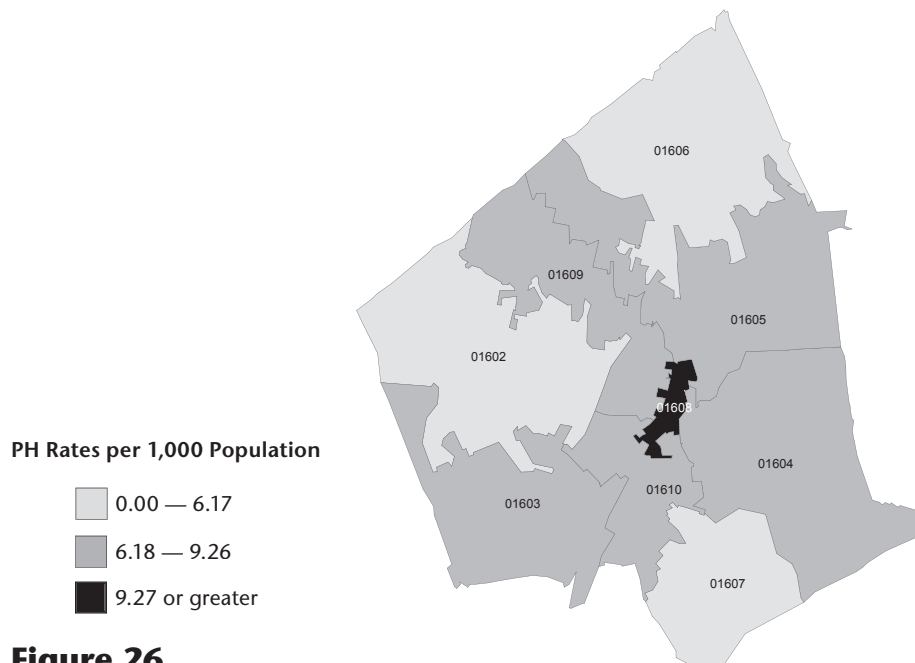


Figure 26

Preventable Hospitalizations in Worcester FY02/FY03, Ages 18-64

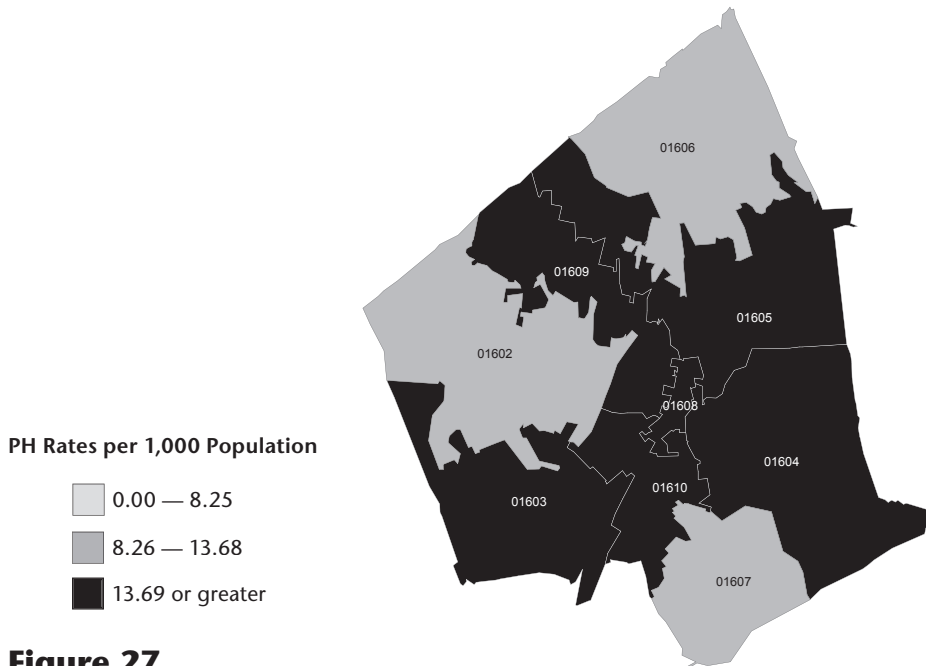


Figure 27

Preventable Hospitalizations in Worcester FY02/FY03, Ages 65 and Older

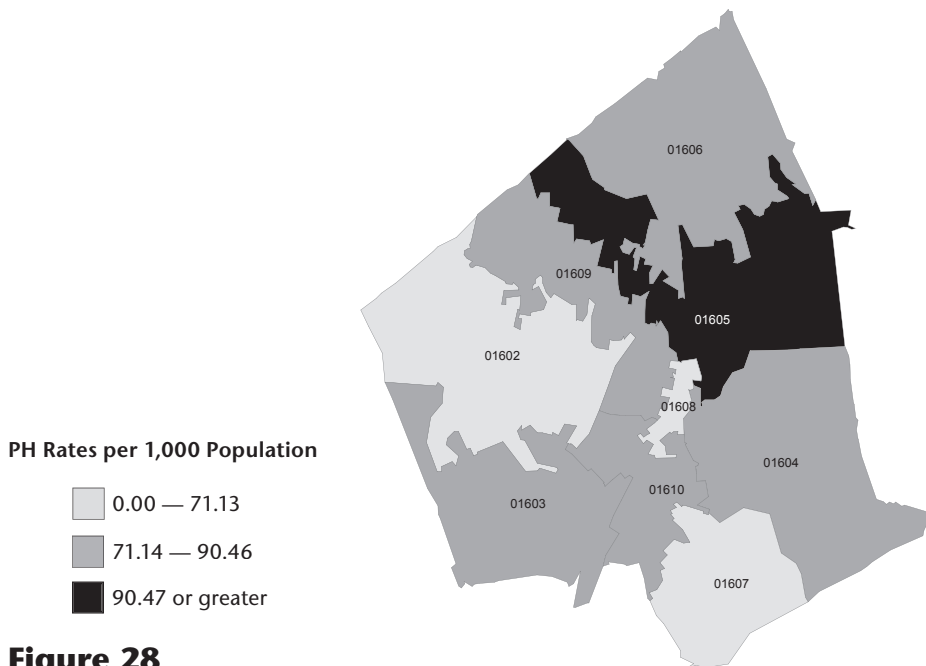


Figure 28

Discussion

In general, hospitalization rates overall and for ACS conditions increased slightly for people ages 0 to 64 and the elderly between FY98/FY99 and FY02/FY03. This finding is in line with other DHCFP reports,²⁰ which have found an upward trend in hospitalizations in Massachusetts. When preventable observation stays were added with inpatient stays, they moderated the rates of change to show a small reduction in preventable events from the previous year (see Figures 1 and 2). This trend was driven by a substantial reduction in preventable observation stays. The 16.0% decrease in total observation stays between FY98/FY99 and FY02/FY03 paled in comparison to the 26.5% decrease in preventable observation stays.

The decreases in observation stays for non-Medicare payers are unusual, especially considering the steady rise in observation stays among non-Medicare payers during the 1990s. There are at least two explanations for this phenomenon. First, the backlash against managed care in the last three years may have forced MCOs to relax their “gate-keeping” or utilization review process for inpatient admissions. Second, hospitals may have gained negotiating powers in light of the MCO backlash or hospital push-back to bill insurers for more profitable inpatient rather than outpatient stays.

Seniors were ten times more likely to be hospitalized for an ACS condition than children, while children were more likely (than both working age adults and seniors) to have an ED visit for an ACS condition.

The patterns of preventable events by payer type showed that the proportion of THs that were preventable among HMOs was not largely different than those of preferred provider, point-of-service or commercial plans.

The uninsured had the lowest ratio of preventable to total ED visits of any non-Medicare payer. Medicaid, which is regarded as providing comprehensive coverage with low or no copayments, had high rates of preventable events compared to payers other than Medicare.

This is important information to policy makers whose goals include improving access to primary health care by increasing the number of people with health insurance. Lack of insurance coverage may contribute less to high PH rates than other characteristics that are common to both the uninsured and the Medicaid population, such as socio-economic characteristics.

Medicare patients incurred the highest proportions of hospitalizations for ACS conditions. This is likely because the populations under such coverage usually have more health care needs stemming from higher rates of co-morbidities.

The first pass at evaluating preventable events by race revealed some noteworthy differences. The most conspicuous finding was the discrepancy in rates of preventable events, particularly preventable ED visit rates per 1,000 population when racial/ethnic distributions were taken into account. The rate of preventable ED visits per 1,000 population was substantially higher for blacks and Hispanics when compared to whites and other groups. However, blacks and Hispanics had equally disproportionate numbers of total ED visits. Therefore, the proportion of total ED visits that were preventable did

not differ dramatically across racial groups. Various racial and ethnic groups tend to use the ED, rather than a primary care provider as their usual source of care. Since EDs are intended to address urgent care needs, follow-up to primary care is likely to be inconsistent. There has been at least one study that points to inadequate follow-up care for ED visits among blacks, Medicaid and uninsured patients.²¹

Assessing preventable ED use by time of day did not reveal any significant difference in patterns of use by race. However, other than children (ages 0-17), people were more

likely to seek ED care during regular office hours. Thirty three percent of children's ED visits were during regular business hours (9:00 a.m. to 5:00 p.m.), equal to the proportion of business hours in a day (eight business hours divided by 24 = 33%).

Preventable hospitalization analysis is one tool that can be used to help assess access to primary health care. Combined with other information it may help communities target opportunities for improving access to primary care and measure the impact of various interventions within and across communities in Massachusetts.

Endnotes for Discussion

²⁰ Division of Health Care Finance and Policy. "Massachusetts Inpatient Hospital Discharge Trends." *Analysis in Brief*. Number 6, April 2004.

²² Oster A, Bindman AB. "ED visits for ambulatory care sensitive conditions." *Medical Care*. 2003; 41:198-207.

Appendix: Tables

Table I: Preventable Hospitalization (PH) Discharges and Observation Stays by Diagnosis for All Ages

Type of Condition	PH Discharges						Preventable Observation Stays		
	1998	1999	2000	2001	2002	2003	1998	1999	2000
B.pneum.	22,225	25,030	25,711	23,897	23,585	23,746	1,483	2,000	2,013
CHF	23,768	22,219	22,478	22,306	21,788	22,089	1,527	1,609	1,556
COPD	13,303	14,271	14,402	13,654	13,047	12,453	1,186	1,416	1,294
Dehydration	8,791	9,305	8,589	10,365	10,589	10,599	3,507	4,114	3,453
Kidney/urin.inf.	8,249	8,445	8,738	9,154	8,807	10,044	1,157	1,156	1,164
Asthma	8,115	8,172	8,196	8,266	7,966	9,448	3,685	3,976	3,687
Cellulitis	6,533	6,408	6,984	6,908	7,282	7,593	931	1,035	1,070
Diabetes	4,551	4,786	5,229	5,577	5,728	6,140	873	932	929
Convulsions	3,329	3,609	3,585	3,744	3,831	3,895	1,377	1,452	1,283
Gastroent.	1,630	1,694	1,880	1,991	1,913	2,261	1,561	1,746	1,321
All Other Conditions (14)	6,777	6,113	6,196	6,026	5,743	5,759	2,823	2,711	2,341
Total Preventable Events	107,271	110,052	111,988	111,888	110,279	114,027	20,110	22,147	20,111
Total Events	728,640	732,673	743,518	760,932	768,117	786,517	138,756	145,734	142,771

Source: Massachusetts Division of Health Care Finance and Policy

2001	Preventable Observation Stays		Ratio of Prev. Obs. Stays to PHs		Outpatient ED Visits		PHs per 1,000 Pop.		ED Visits
	2002	2003	FY98/FY99	FY02/FY03	2002	2003	FY98/FY99	FY02/FY03	FY02/FY03
1,544	1,492	1,362	7.4%	6.0%	16,098	16,271	3.83	3.70	2.53
1,064	1,054	915	6.8%	4.5%	3,075	2,615	3.73	3.43	0.45
956	883	777	9.4%	6.5%	7,071	6,741	2.24	1.99	1.08
4,145	3,327	3,818	42.1%	33.7%	9,600	9,987	1.47	1.66	1.53
991	924	928	13.9%	9.8%	31,712	31,203	1.35	1.47	4.92
2,928	2,622	2,624	47.0%	30.1%	38,494	39,493	1.32	1.36	6.10
905	726	801	15.2%	10.3%	36,725	40,034	1.05	1.16	6.00
763	771	838	19.3%	13.6%	8,866	9,037	0.76	0.93	1.40
1,014	1,053	984	40.8%	26.4%	14,496	14,269	0.56	0.60	2.25
1,163	1,109	1,067	99.5%	52.1%	20,618	22,419	0.27	0.33	3.37
1,926	1,929	1,772	42.9%	32.2%	127,912	124,325	1.04	0.90	19.73
17,399	15,890	15,886	19.4%	14.2%	314,667	316,394	17.62	17.54	49.35
127,778	124,291	120,892	19.5%	15.8%	2,202,398	2,172,243	118.45	121.59	342.13

Table 2: Preventable Hospitalization (PH) Discharges and Observation Stays by Diagnosis for Ages 0-64

Type of Condition	PH Discharges						Preventable Observation Stays		
	1998	1999	2000	2001	2002	2003	1998	1999	2000
B.pneum.	6,811	7,930	8,163	7,552	7,498	7,868	1,041	1,414	1,350
Asthma	6,601	6,585	6,680	6,793	6,446	7,738	3,450	3,724	3,468
Cellulitis	3,794	3,681	4,059	4,121	4,423	4,567	748	804	817
Dehydration	3,412	3,584	3,222	4,514	3,965	4,667	2,651	3,247	2,629
COPD	3,608	3,870	4,126	3,897	3,806	3,650	424	465	444
CHF	3,545	3,350	3,518	3,673	3,662	3,906	307	342	313
Diabetes	2,857	2,940	3,233	3,565	3,645	3,866	567	592	579
Kidney/urin.inf.	3,012	2,959	3,000	3,236	3,215	3,399	718	716	722
Convulsions	2,113	2,358	2,372	2,548	2,578	2,649	1,184	1,248	1,086
Gastroent.	953	1,008	1,127	1,214	1,183	1,350	1,300	1,465	1,077
All Other Conditions (14)	4,027	3,780	3,815	3,758	3,650	3,806	1,856	1,796	1,563
Total Preventable Events	40,733	42,045	43,315	44,871	44,071	47,466	14,246	15,813	14,048
Total Events	440,372	442,052	452,111	464,668	470,997	485,185	103,584	108,301	107,953

Source: Massachusetts Division of Health Care Finance and Policy

Preventable Observation Stays			Ratio of Prev. Obs. Stays to PHs		Outpatient ED Visits		PHs per 1,000 Pop.		ED Visits
2001	2002	2003	FY98/99	FY02/03	2002	2003	FY98/99	FY02/03	FY02/03
1,081	1,046	986	16.7%	14.1%	12,429	12,877	1.40	1.39	2.29
2,776	2,489	2,466	54.4%	39.8%	36,679	37,893	1.25	1.28	6.74
727	577	659	20.8%	15.3%	30,349	33,810	0.71	0.81	5.80
3,445	2,675	3,170	84.3%	72.2%	7,546	8,083	0.66	0.78	1.41
317	325	313	11.9%	8.3%	3,079	3,070	0.71	0.67	0.56
238	233	221	9.4%	6.4%	685	586	0.65	0.68	0.11
468	474	506	20.0%	13.1%	6,178	6,310	0.55	0.68	1.13
619	570	552	24.0%	18.4%	25,665	25,182	0.57	0.60	4.59
890	927	881	54.4%	35.4%	13,496	13,294	0.42	0.47	2.42
991	921	863	141.0%	79.8%	19,301	20,825	0.19	0.23	3.63
1,330	1,455	1,338	46.8%	37.6%	121,781	118,510	0.74	0.67	21.71
12,882	11,692	11,955	36.3%	25.8%	277,188	280,440	7.86	8.27	50.38
98,779	96,838	95,498	24.0%	20.9%	2,053,734	1,921,860	83.77	86.39	359.19

Table 3: Preventable Hospitalization (PH) Discharges and Observation Stays by Diagnosis for Ages 0-17

Type of Condition	PH Discharges						Preventable Observation Stays		
	1998	1999	2000	2001	2002	2003	1998	1999	2000
Asthma	2,274	2,348	2,351	2,564	2,386	3,197	1,655	1,845	1,872
Dehydration	1,556	1,734	1,421	2,455	1,660	2,415	1,736	2,225	1,755
B.pneum.	1,445	1,770	1,531	1,596	1,640	1,657	576	781	729
Kidney/urin.inf.	859	836	814	797	845	766	149	177	150
Convulsions	649	734	683	777	762	761	385	400	367
Cellulitis	636	602	655	612	676	679	180	180	179
Diabetes	395	411	445	428	477	441	69	64	79
Sev.ENTinf.	284	328	335	308	307	332	369	350	340
Gastroent.	309	326	342	324	236	269	608	780	498
GM&epil.conv.	212	199	169	221	230	257	55	42	29
All Other Conditions	354	308	354	306	311	304	75	66	69
Total Preventable Events	8,973	9,596	9,100	10,388	9,530	11,078	5,857	6,910	6,067
Total Events	120,408	119,206	119,601	119,680	117,743	120,116	18,887	21,349	20,524

Note: n/a = not applicable.

Source: Massachusetts Division of Health Care Finance and Policy

Preventable Observation Stays			Ratio of Prev. Obs. Stays to PHs		Outpatient ED Visits		PHs per 1,000 Pop.		ED Visits
2001	2002	2003	FY98/99	FY02/03	2002	2003	FY98/99	FY02/03	FY02/03
1,556	1,463	1,494	75.7%	59.7%	11797	12,617	1.63	1.86	8.13
2,625	1,845	2,326	120.4%	101.4%	2505	3,142	1.16	1.36	1.88
595	587	544	42.2%	35.0%	4808	4,960	1.14	1.10	3.25
138	129	132	19.2%	15.9%	4055	3,843	0.60	0.54	2.63
354	363	358	56.8%	46.8%	3720	3,687	0.49	0.51	2.47
152	150	162	29.1%	24.2%	3181	3,638	0.44	0.45	2.27
50	44	37	29.1%	9.0%	312	301	0.28	0.31	0.20
317	371	307	16.5%	110.2%	59103	56,801	0.22	0.21	38.58
531	399	358	117.5%	135.2%	7040	8,284	0.22	0.17	5.10
40	45	68	218.6%	25.1%	284	230	0.15	0.16	0.17
49	48	56	23.6%	16.9%	319	0	0.23	0.20	0.11
6,407	5,444	5,842	68.8%	54.8%	97,124	97,785	6.57	6.86	64.88
21,119	19,677	18,645	16.8%	16.1%	476,666	468,782	84.73	79.18	314.73

Table 4: Preventable Hospitalization (PH) Discharges and Observation Stays by Diagnosis for Ages 18-64

Type of Condition	PH Discharges						Preventable Observation Stays		
	1998	1999	2000	2001	2002	2003	1998	1999	2000
B.pneum.	5,366	6,160	6,632	5,956	5,858	6,211	465	633	621
Asthma	4,327	4,237	4,329	4,229	4,060	4,541	1,795	1,879	1,596
COPD	3,581	3,848	4,109	3,883	3,785	3,638	414	456	434
CHF	3,502	3,317	3,482	3,639	3,623	3,879	298	338	304
Cellulitis	3,158	3,079	3,404	3,509	3,747	3,888	568	624	638
Diabetes	2,462	2,529	2,788	3,137	3,168	3,425	498	528	500
Kidney/urin.inf.	2,153	2,123	2,186	2,439	2,370	2,633	569	539	572
Dehydration	1,856	1,850	1,801	2,059	2,305	2,252	915	1,022	874
Convulsions	1,464	1,624	1,689	1,771	1,816	1,888	799	848	719
Gastroent.	644	682	785	890	947	1,081	692	685	579
All Other									
Conditions (14)	3,247	3,000	3,010	2,971	2,862	2,952	1,376	1,351	1,144
Total Preventable									
Events	31,760	32,449	34,215	34,483	34,541	36,388	8,389	8,903	7,981
Total Events	323,996	326,287	333,539	336,427	344,564	365,069	81,762	87,668	87,429

Notes: COPD = Chronic Obstructive Pulmonary Disease, n/a = not applicable.
Source: Massachusetts Division of Health Care Finance and Policy

Preventable Observation Stays			Ratio of Prev. Obs. Stays to PHs		Outpatient ED Visits		PHs per 1,000 Pop.		ED Visits
2001	2002	2003	FY98/99	FY02/03	2002	2003	FY98/99	FY02/03	FY02/03
486	459	442	9.5%	68.6%	7,621	7,917	1.50	1.50	1.93
1,220	1,026	972	42.9%	27.1%	24,882	25,276	1.11	1.07	6.22
313	320	311	11.7%	8.3%	3,030	3,053	0.96	0.92	0.75
235	231	220	9.3%	6.4%	670	575	0.88	0.93	0.15
575	427	497	19.1%	13.8%	27,168	30,172	0.81	0.95	7.11
418	430	469	20.6%	13.4%	5,866	6,009	0.65	0.82	1.47
481	441	420	25.9%	19.2%	21,610	21,339	0.55	0.62	5.33
820	830	844	52.3%	37.8%	5,041	4,941	0.48	0.57	1.24
536	564	523	53.3%	30.7%	9,776	9,607	0.40	0.46	2.40
460	522	505	103.8%	53.5%	12,261	12,541	0.17	0.25	3.08
931	998	910	43.7%	33.1%	62,139	61,225	0.81	0.72	15.30
6,475	6,248	6,113	26.9%	17.4%	180,064	182,655	8.33	8.80	44.98
83,589	82,630	76,853	26.1%	24.4%	1,466,435	1,453,078	84.38	88.00	362.03

Table 5: Preventable Hospitalization (PH) Admissions and Observation Stays by Diagnosis for Ages 65 and Older

Type of Condition	PH Discharges						Preventable Observation Stays		
	FY98	FY99	FY00	FY01	FY02	FY03	FY98	FY99	FY00
CCHF	20,223	18,869	18,960	18,633	18,126	18,183	1,220	1,267	1,243
B.pneum.	15,414	17,100	17,548	16,345	16,087	15,878	442	586	663
COPD	9,695	10,401	10,276	9,757	9,241	8,803	762	951	850
Kidney/urin.inf.	5,237	5,486	5,738	5,918	5,592	6,645	439	440	442
Dehydration	5,379	5,721	5,367	5,851	6,624	5,932	856	867	824
Cellulitis	2,739	2,727	2,925	2,787	2,859	3,026	183	231	253
Diabetes	1,694	1,846	1,996	2,012	2,083	2,274	306	340	350
Asthma	1,514	1,587	1,516	1,473	1,520	1,710	235	252	219
Convulsions	1,216	1,251	1,213	1,196	1,253	1,246	193	204	197
Angina	1,799	1,398	1,354	1,207	937	751	716	634	529
All Other									
Conditions (14)	1,628	1,621	1,780	1,838	1,886	2,113	512	562	493
Total Preventable									
Events	66,538	68,007	68,673	67,017	66,208	66,561	5,864	6,334	6,063
Total Events	291,154	292,212	291,871	289,168	291,097	301,332	35,004	36,971	35,083

Notes: COPD = Chronic Obstructive Pulmonary Disease, n/a = not applicable.
Source: Massachusetts Division of Health Care Finance and Policy

FY01	Preventable Observation Stays		Ratio of Prev. Obs. Stays to PHs		Outpatient ED Visits		PHs per 1,000 Pop.		ED Visits
	FY02	FY03	FY98/99	FY02/03	FY02	FY03	FY98/99	FY02/03	FY02/03
826	821	694	6.4%	4.5%	2,390	2,029	22.18	21.13	2.57
463	446	376	3.2%	2.8%	3,669	3,394	18.45	18.60	4.11
639	558	464	8.5%	6.3%	3,992	3,671	11.40	10.50	4.46
372	354	376	8.2%	6.3%	6,047	6,021	6.08	7.12	7.02
700	652	648	15.5%	10.8%	2,054	1,904	6.30	7.31	2.30
178	149	142	7.6%	5.8%	6,376	6,224	3.10	3.43	7.33
295	297	332	18.2%	14.5%	2,688	2,727	2.01	2.54	3.15
152	133	158	15.7%	9.5%	1,815	1,600	1.76	1.88	1.99
124	126	103	16.1%	10.2%	1,000	975	1.40	1.45	1.15
375	282	262	42.2%	30.6%	853	747	1.81	0.98	0.93
393	380	376	33.1%	20.8%	6,595	6,662	1.84	2.33	7.72
4,517	4,198	3,931	9.1%	6.1%	37,479	35,954	78.31	77.28	42.74
30,346	28,651	25,406	12.3%	10.2%	273,761	259,297	331.03	344.81	310.26

Table 6: Preventable Hospitalization (PH) Admissions and Observation Stays by Payer for All Ages

Type of Payer	PH Discharges						Preventable Observation Stays		
	FY98	FY99	2000	2001	2002	2003	FY98	FY99	2000
Commercial	10,512	6,285	5,595	5,872	5,721	5,743	2,052	2,397	2,038
PPO	1,748	2,436	2,430	2,992	3,060	3,365	854	986	881
POS	399	417	472	601	580	451	143	148	157
HMO	13,315	17,323	17,511	17,132	16,757	18,067	6,070	6,853	6,387
Medicare	59,561	58,910	59,600	58,527	58,064	60,892	4,406	4,033	3,421
Medicare MCO	8,210	10,783	11,180	11,177	10,873	9,115	1,415	2,228	2,426
Medicaid PCC	6,237	7,155	7,844	8,038	7,477	7,227	2,713	3,388	2,917
Medicaid MCO	2,959	3,106	3,471	3,618	3,555	3,828	1,088	994	870
Uninsured	3,701	3,027	3,182	3,196	3,385	4,265	1,230	990	904
Other Payer	644	621	681	706	775	819	137	127	109
Total Preventable									
Events	107,286	110,063	111,966	111,859	110,247	113,772	20,108	22,144	20,110
Total	735,593	737,747	745,011	745,275	753,404	786,517	139,008	145,989	143,036

Notes: The HMO payer group does not include Medicaid or Medicare members. The uninsured category consists of free care and self-pay discharges. Medicare eligibility for the population under 65 is based on disability criteria. Percentages may not add up to 100 due to rounding. n/a = not applicable.

Source: Massachusetts Division of Health Care Finance and Policy

Preventable Observation Stays			Ratio of Prev. Obs. Stays to PHs		Outpatient ED Visits		Proportion of Total PHs	
2001	2002	2003	FY98/99	FY02/03	2002	2003	FY98/99	FY02/03
2,024	1,664	1,623	26.5%	31.8%	35,071	34,310	12.6%	9.3%
881	835	773	44.0%	28.4%	16,290	16,716	6.5%	7.6%
219	172	138	35.7%	33.1%	3,296	2,744	7.7%	8.1%
5,875	5,226	5,578	42.2%	32.8%	94,160	97,139	7.5%	8.4%
2,202	2,203	2,429	7.1%	3.8%	40,223	40,766	23.2%	22.1%
2,020	1,737	1,396	19.2%	17.0%	6,261	5,197	21.3%	19.9%
2,468	2,436	2,210	45.6%	31.6%	51,241	44,257	11.3%	10.9%
862	842	894	34.3%	23.8%	23,561	25,328	12.1%	11.4%
721	684	754	33.0%	21.3%	40,715	46,309	11.7%	12.8%
125	89	92	20.9%	14.4%	3,829	3,592	7.1%	8.2%
17,397	15,888	15,887	19.4%	14.2%	314,647	316,358	n/a	n/a
128,006	124,483	120,892	19.3%	16.8%	2,202,287	2,172,345	n/a	n/a

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code

Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
01001	01001	12.8	Agawam		01050	11.1	Huntington
01002	01002	8.8	Amherst		01070	11.1	Plainfield
	01003	8.8	Amherst		01084	11.1	West Chesterfield
	01004	8.8	Amherst		01098	11.1	Worthington
	01059	8.8	North Amherst		01243	11.1	Middlefield
01005	01005	13.6	Barre	01056	01056	10.7	Ludlow
	01074	13.6	South Barre	01057	01057	14.4	Monson
01007	01007	14.4	Belchertown	01060	01060	22	Northampton
01010	01010	15.3	Brimfield		01061	22	Northampton
	01081	15.3	Wales	01062	01053	16.8	Leeds
	01521	15.3	Holland		01062	16.8	Florence
01013	01013	14.1	Chicopee	01068	01031	13.4	Gilbertville
	01014	14.1	Chicopee		01068	13.4	Oakham
01020	01020	15	Chicopee		01094	13.4	Wheelwright
	01021	15	Chicopee		01531	13.4	New Braintree
	01022	15	Chicopee	01069	01009	20.5	Bondsville
01027	01027	14.7	Easthampton		01069	20.5	Palmer
01028	01028	10.6	East Longmeadow		01079	20.5	Thorndike
01030	01030	11	Feeding Hills		01080	20.5	Three Rivers
01033	01033	10.6	Granby	01071	01008	9.1	Blandford
01035	01035	11.3	Hadley		01011	9.1	Chester
01036	01036	9.3	Hampden		01034	9.1	Granville
01038	01038	10.4	Hatfield		01071	9.1	Russell
	01039	10.4	Haydenville	01073	01073	13.8	Southampton
	01066	10.4	North Hatfield	01075	01075	11.8	South Hadley
	01088	10.4	West Hatfield	01077	01077	13.3	Southwick
	01096	10.4	Williamsburg	01082	01037	19.8	Hardwick
01040	01040	21.2	Holyoke		01082	19.8	Ware
	01041	21.2	Holyoke	01085	01085	13.6	Westfield
01050	01012	11.1	Chesterfield		01086	13.6	Westfield
	01026	11.1	Cummington		01097	13.6	Woronoco
	01032	11.1	Goshen	01089	01089	13.5	West Springfield

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)**Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.*

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
01095	01090	13.5	West Springfield	01226	01226	14	Dalton
	01095	12.9	Wilbraham		01227	14	Dalton
01104	01101	21.8	Springfield	01230	01230	9.8	Great Barrington
	01102	21.8	Springfield		01244	9.8	Mill River
01105	01104	21.8	Springfield		01252	9.8	North Egremont
	01103	29.3	Springfield	01236	01229	10.2	Glendale
	01105	29.3	Springfield		01236	10.2	Housatonic
	01115	29.3	Springfield		01262	10.2	Stockbridge
01106	01199	29.3	Springfield		01266	10.2	West Stockbridge
	01106	7.3	Longmeadow	01238	01238	13.1	Lee
	01116	7.3	Longmeadow		01242	13.1	Lenox Dale
01107	01107	27.6	Springfield		01260	13.1	South Lee
01108	01108	17.7	Springfield		01264	13.1	Tyringham
	01138	17.7	Springfield	01240	01240	15.2	Lenox
01109	01109	23.3	Springfield		01254	15.2	Richmond
	01111	23.3	Springfield	01247	01247	20.3	North Adams
01118	01139	23.3	Springfield		01343	20.3	Drury
	01118	9.7	Springfield	01257	01029	12.7	East Otis
	01119	11.5	Springfield		01222	12.7	Ashley Falls
01129	01128	10.4	Springfield		01245	12.7	Monterey
	01129	10.4	Springfield		01253	12.7	Otis
01151	01151	15.4	Indian Orchard		01255	12.7	Sandisfield
01201	01201	18	Pittsfield		01257	12.7	Sheffield
	01202	18	Pittsfield		01258	12.7	South Egremont
01220	01220	15.4	Adams		01259	12.7	Southfield
	01224	15.4	Berkshire/Lanesboro	01267	01267	13.9	Williamstown
01225	01237	15.4	Lanesboro	01301	01301	16.7	Greenfield
	01223	15	Becket		01302	16.7	Greenfield
	01225	15	Cheshire	01331	01331	20.6	Athol
	01235	15	Hinsdale		01366	20.6	Petersham
	01256	15	Savoy		01368	20.6	Royalston
	01270	15	Windsor	01337	01337	8.6	Bernardston

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)*

Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
	01354	8.6	Gill/Mt. Herman		01467	11.8	Still River
	01360	8.6	Northfield		01740	11.8	Bolton
01341	01330	11.6	Ashfield	01453	01453	13.2	Leominster
	01339	11.6	Charlemont	01460	01460	13.4	Littleton
	01341	11.6	Conway	01462	01462	12.5	Lunenburg
	01346	11.6	Heath	01463	01463	12.7	Pepperell
	01350	11.6	Monroe Bridge	01464	01464	19	Shirley
	01367	11.6	Rowe		01472	19	West Groton
01351	01344	11	Erving	01468	01436	19.7	Baldwinville
	01347	11	Lake Pleasant		01438	19.7	East Templeton
	01349	11	Turners Falls		01468	19.7	Templeton
	01351	11	Montague	01469	01431	13.8	Ashby
	01378	11	Warwick		01469	13.8	Townsend
	01379	11	Wendell		01474	13.8	West Townsend
01364	01364	22.1	Orange	01473	01430	12	Ashburnham
01370	01338	11	Buckland		01473	12	Westminster
	01340	11	Colrain	01475	01475	21.8	Winchendon
	01370	11	Shelburne Falls		01477	21.8	Winchendon Springs
01373	01093	12	Whately	01501	01501	14.5	Auburn
	01342	12	Deerfield	01504	01504	10.3	Blackstone
	01373	12	South Deerfield	01506	01092	13.8	West Warren
01375	01054	10	Leverett		01506	13.8	Brookfield
	01072	10	Shutesbury	01507	01507	15.6	Charlton
	01355	10	New Salem		01508	15.6	Charlton City
	01375	10	Sunderland		01509	15.6	Charlton Depot
01376	01376	16.5	Turners Falls	01510	01510	18.5	Clinton
01420	01420	17.3	Fitchburg	01516	01516	18.2	Douglas
01432	01432	20.8	Ayer	01519	01519	10.9	Grafton
01440	01440	19.6	Gardner		01560	10.9	South Grafton
01450	01450	15.7	Groton	01520	01520	11.1	Holden
	01827	15.7	Dunstable		01522	11.1	Jefferson
01451	01451	11.8	Harvard	01523	01523	16.9	Lancaster

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)**Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.*

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
01524	01561	16.9	South Lancaster	01583	01503	13.2	Berlin
	01524	16.5	Leicester		01505	13.2	Boylston
	01542	16.5	Rochdale		01583	13.2	West Boylston
	01611	16.5	Cherry Valley	01585	01083	17.8	Warren
01527	01527	15.6	Millbury		01585	17.8	West Brookfield
	01586	15.6	West Millbury	01588	01525	15.9	Linwood
01532	01532	11.7	Northborough		01534	15.9	Northbridge
01535	01515	11.9	East Brookfield		01588	15.9	Whitinsville
01536	01535	11.9	North Brookfield	01590	01526	10.5	Manchaug
	01536	10.1	North Grafton		01590	10.5	Sutton
01540	01537	18.7	North Oxford	01602	01602	17	Worcester
	01540	18.7	Oxford	01603	01603	21.6	Worcester
01541	01452	15.8	Hubbardston	01604	01604	21	Worcester
	01517	15.8	E Princeton		01613	21	Worcester
01543	01541	15.8	Princeton	01605	01605	24.9	Worcester
	01543	11.6	Rutland		01615	24.9	Worcester
01545	01612	11.6	Paxton		01655	24.9	Worcester
	01545	12.5	Shrewsbury	01606	01606	18.7	Worcester
01550	01546	12.5	Shrewsbury	01607	01607	18.3	Worcester
	01550	20.2	Southbridge	01608*	01601	28.7	Worcester
01562	01562	17.3	Spencer		01608	28.7	Worcester
01564	01564	15.2	Sterling		01614	28.7	Worcester
01566	01518	12.8	Fiskdale	01609	01609	23.1	Worcester
	01566	12.8	Sturbridge	01610	01610	26.1	Worcester
01568	01568	15.9	Upton	01701	01701	14.7	Framingham
01569	01538	17.5	North Uxbridge		01703	14.7	Framingham
01570	01569	17.5	Uxbridge		01704	14.7	Framingham
	01570	26.9	Webster		01705	14.7	Framingham
01571	01571	16.2	Dudley	01702	01702	20.6	Framingham
01581	01580	15.1	Westborough	01720	01718	10.9	Village Of Nagog Wood
	01581	15.1	Westborough		01719	10.9	Boxborough
	01582	15.1	Westborough		01720	10.9	Acton

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code (continued)

Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
01721	01721	14.4	Ashland	01824	01822	12.7	Billerica
01730	01730	10.7	Bedford		01824	12.7	Chelmsford
	01731	10.7	Hanscom Afb	01826	01826	15.1	Dracut
01742	01741	10.3	Carlisle	01830	01830	22.4	Haverhill
	01742	10.3	Concord		01831	22.4	Haverhill
01746	01746	11	Holliston	01832	01832	15.1	Haverhill
	01770	11	Sherborn	01833	01833	14.7	Georgetown
01747	01747	17.6	Hopedale	01834	01834	13.3	Groveland
01748	01748	14.1	Hopkinton	01835	01835	12.9	Haverhill
	01784	14.1	Woodville	01841	01840	28.9	Lawrence
01749	01749	12.6	Hudson		01841	28.9	Lawrence
01752	01752	15.9	Marlborough		01842	28.9	Lawrence
01754	01754	13.4	Maynard	01843	01843	20.1	Lawrence
01756	01529	14.6	Millville	01844	01844	19	Methuen
	01756	14.6	Mendon	01845	01845	15.9	North Andover
01757	01757	17	Milford	01850	01850	18.6	Lowell
01760	01760	17.9	Natick	01851	01851	16.9	Lowell
01772	01745	9.9	Fayville	01852	01852	21.9	Lowell
	01772	9.9	Southborough	01854	01853	22.3	Lowell
01773	01773	7.9	Lincoln		01854	22.3	Lowell
01775	01775	9.6	Stow	01860	01860	14.8	Merrimac
01776	01776	16.1	Sudbury	01862	01862	13.6	North Billerica
01778	01778	12.9	Wayland	01863	01863	18.1	North Chelmsford
01801	01801	17.1	Woburn	01864	01864	13.5	North Reading
	01807	17.1	Woburn	01867	01867	13.3	Reading
	01888	17.1	Woburn	01876	01876	15.8	Tewksbury
01803	01803	14.1	Burlington	01879	01879	13.7	Tyngsboro
	01805	14.1	Burlington	01880	01880	14.4	Wakefield
01810	01810	14.2	Andover	01886	01886	12.2	Westford
01821	01821	16.8	Billerica	01887	01887	15.3	Wilmington
	01865	16.8	Nutting Lake	01890	01890	12.2	Winchester
	01866	16.8	Pinehurst	01902	01901	24.5	Lynn

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)**Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.*

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
	01902	24.5	Lynn		01982	8.7	South Hamilton
	01903	24.5	Lynn		01984	8.7	Wenham
01904	01904	18	Lynn	01983	01983	10.2	Topsfield
01905	01905	19.1	Lynn	01985	01922	13.3	Byfield
	01910	19.1	Lynn		01951	13.3	Newbury
01906	01906	16.7	Saugus		01985	13.3	West Newbury
01907	01907	11.6	Swampscott	02019	02019	13.1	Bellingham
	01908	11.6	Nahant	02021	02021	19.1	Canton
01913	01913	19.3	Amesbury	02025	02025	13.5	Cohasset
01915	01915	17	Beverly	02026	02026	17.9	Dedham
	01965	17	Prides Crossing		02027	17.9	Dedham
01921	01885	8.9	West Boxford	02030	02030	8.7	Dover
	01921	8.9	Boxford	02035	02035	17.4	Foxboro
01923	01923	15.7	Danvers	02038	02038	16.7	Franklin
	01937	15.7	Hathorne	02043	02018	15.3	Accord
01930	01930	16.6	Gloucester		02043	15.3	Hingham
	01931	16.6	Gloucester	02045	02045	19.7	Hull
01938	01929	12.2	Essex	02048	02048	16.3	Mansfield
	01938	12.2	Ipswich	02050	02020	15.9	Brant Rock
01940	01940	9.9	Lynnfield		02041	15.9	Green Harbor
01944	01944	9.4	Manchester		02047	15.9	Humarock
01945	01945	9.1	Marblehead		02050	15.9	Marshfield
01949	01949	12	Middleton		02051	15.9	Marshfield Hills
01950	01950	18.4	Newburyport		02059	15.9	North Marshfield
01952	01952	19.5	Salisbury		02065	15.9	Ocean Bluff
01960	01960	15.9	Peabody	02052	02052	11.6	Medfield
	01961	15.9	Peabody	02053	02053	13.8	Medway
01966	01966	11.5	Rockport	02054	02054	15.6	Millis
01969	01969	12.1	Rowley	02056	02056	13.3	Norfolk
01970	01970	16.2	Salem	02061	02061	16	Norwell
	01971	16.2	Salem	02062	02062	21.4	Norwood
01982	01936	8.7	Hamilton	02066	02040	13.4	Greenbush

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)*

Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
	02055	13.4	Minot		02222	13.5	Boston
	02060	13.4	North Scituate	02115	02115	17.1	Boston
	02066	13.4	Scituate		02123	17.1	Boston
02067	02067	14.2	Sharon		02199	17.1	Boston
02072	02072	17.6	Stoughton	02116	02116	10.8	Boston
02081	02032	16.8	East Walpole		02117	10.8	Boston
	02071	16.8	South Walpole	02118	02118	33.3	Boston
	02081	16.8	Walpole	02119	02119	44.7	Boston
02090	02090	12.3	Westwood	02120	02120	25	Boston
02093	02070	23.3	Sheldonville	02121	02121	29.4	Boston
	02093	23.3	Wrentham	02122	02122	25.3	Boston
02111	02110	13.9	Boston	02124	02124	30.5	Boston
	02111	13.9	Boston	02125	02125	29	Boston
	02210	13.9	Boston	02126	02126	21.6	Mattapan
02113	02101	17.2	Boston	02127	02127	26.4	Boston
	02102	17.2	Boston		02205	26.4	Boston
	02103	17.2	Boston		02293	26.4	Boston
	02104	17.2	Boston		02297	26.4	Boston
	02105	17.2	Boston	02128	02128	19	Boston
	02106	17.2	Boston		02228	19	Boston
	02107	17.2	Boston	02129	02129	17.2	Charlestown
	02109	17.2	Boston	02130	02130	23.5	Jamaica Plain
	02112	17.2	Boston	02131	02131	18.2	Roslindale
	02113	17.2	Boston	02132	02132	15.1	West Roxbury
	02208	17.2	Boston	02134	02134	15	Allston
	02209	17.2	Boston		02163	15	Boston
	02211	17.2	Boston	02135	02135	19.5	Brighton
	02216	17.2	Boston	02136	02136	24	Hyde Park
02114	02108	13.5	Boston		02137	24	Readville
	02114	13.5	Boston	02138	02138	11.8	Cambridge
	02133	13.5	Boston	02139	02139	18.8	Cambridge
	02201	13.5	Boston		02238	18.8	Cambridge

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)**Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.*

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
	02239	18.8	Cambridge		02305	28.9	Brockton
02140	02140	15.3	Cambridge	02302	02302	24	Brockton
02141	02141	15.5	Cambridge		02303	24	Brockton
	02142	15.5	Cambridge	02322	02322	15.4	Avon
02143	02143	20	Somerville	02324	02324	16.4	Bridgewater
02144	02144	18.8	Somerville		02325	16.4	Bridgewater
02145	02145	20.9	Somerville	02330	02330	15.1	Carver
02148	02148	17.9	Malden		02355	15.1	North Carver
02149	02149	22.5	Everett		02366	15.1	South Carver
02150	02150	23.3	Chelsea	02332	02331	15	Duxbury
02151	02151	20.1	Revere		02332	15	Duxbury
02152	02152	15.7	Winthrop	02333	02333	18.5	East Bridgewater
02155	02153	17.9	Medford		02337	18.5	Elmwood
	02155	17.9	Medford	02338	02338	17.2	Halifax
	02156	17.9	West Medford	02339	02339	14.6	Hanover
02169	02169	24.4	Quincy		02340	14.6	Hanover
	02269	24.4	Quincy	02341	02341	18.6	Hanson
02170	02170	14.7	Quincy		02350	18.6	Monponsett
02171	02171	16.2	Quincy	02343	02343	19.8	Holbrook
02176	02176	15.4	Melrose	02346	02344	19	Middleboro
02180	02180	15.6	Stoneham		02346	19	Middleboro
02184	02184	18.9	Braintree	02347	02347	11.5	Lakeville
	02185	18.9	Braintree		02349	11.5	Middleboro
02186	02186	16.3	Milton		02770	11.5	Rochester
	02187	16.3	Milton Village	02351	02351	20.5	Abington
02188	02188	26.2	Weymouth	02356	02334	17	Easton
02189	02189	19.6	Weymouth		02356	17	North Easton
02190	02190	15.3	Weymouth		02357	17	North Easton
02191	02191	14.9	Weymouth	02359	02327	16.5	Bryantville
02215	02215	20.6	Boston		02358	16.5	North Pembroke
02301	02301	28.9	Brockton		02359	16.5	Pembroke
	02304	28.9	Brockton	02360	02345	19.6	Manomet

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)*

Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
	02360	19.6	Plymouth	02465	02465	12.9	Newton
	02361	19.6	Plymouth	02466	02462	18.1	Newton
	02362	19.6	Plymouth		02466	18.1	Auburndale
	02381	19.6	White Horse Beach	02467	02467	12	Chestnut Hill
02364	02364	18.5	Kingston	02468	02468	8.3	Waban
	02367	18.5	Plympton	02472	02471	15.9	Watertown
02368	02368	20	Randolph		02472	15.9	Watertown
02370	02370	20.9	Rockland	02474	02174	13	Arlington
02375	02375	12.8	South Easton		02175	13	Arlington
02379	02379	21.5	West Bridgewater		02474	13	Arlington
02382	02382	19.9	Whitman		02475	13	Arlington Heights
02421	02173	11	Lexington		02476	13	Arlington
	02420	11	Lexington	02478	02478	12.2	Belmont
	02421	11	Lexington		02479	12.2	Waverley
02446	02146	13.9	Brookline	02481	02157	9.3	Wellesley
	02147	13.9	Brookline		02181	9.3	Wellesley
	02445	13.9	Brookline		02457	9.3	Babson Park
	02446	13.9	Brookline		02481	9.3	Wellesley
	02447	13.9	Brookline Village		02482	9.3	Wellesley
02453	02154	18.7	Waltham	02492	02492	14.8	Needham
	02451	18.7	Waltham	02493	02493	10	Weston
	02452	18.7	Waltham	02494	02494	15.6	Needham
	02453	18.7	Waltham	02532	02532	13.8	Buzzards Bay
	02454	18.7	Waltham		02542	13.8	Buzzards Bay
	02455	18.7	Waltham		02561	13.8	Sagamore
02458	02158	17	Newton		02562	13.8	Sagamore Beach
	02458	17	Newton	02536	02536	13.9	East Falmouth
	02495	17	Newton	02537	02537	10.3	East Sandwich
02459	02459	10.1	Newton	02538	02538	35.6	East Wareham
02460	02460	14	Newton		02558	35.6	Onset
02461	02461	11.7	Newton	02539	02535	12.3	Chilmark
	02464	11.7	Newton		02539	12.3	Edgartown

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)**Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.*

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
	02552	12.3	Menemsha		02670	13.5	West Dennis
	02575	12.3	West Tisbury	02642	02642	7.6	Eastham
	02713	12.3	Cuttyhunk		02651	7.6	North Eastham
02540	02540	15	Falmouth		02663	7.6	South Wellfleet
	02541	15	Falmouth		02667	7.6	Wellfleet
	02543	15	Woods Hole	02645	02645	9.1	Harwich
	02556	15	North Falmouth		02646	9.1	Harwich Port
	02565	15	Silver Beach		02661	9.1	South Harwich
	02574	15	West Falmouth		02671	9.1	West Harwich
02554	02554	13.3	Nantucket	02648	02648	8.1	Marstons Mills
	02564	13.3	Siasconset	02649	02649	12.8	Mashpee
	02584	13.3	Nantucket	02653	02643	8.8	East Orleans
02559	02534	15.1	Cataumet		02653	8.8	Orleans
	02553	15.1	Monument Beach		02662	8.8	South Orleans
	02559	15.1	Pocasset	02655	02635	8	Cotuit
02563	02563	14.7	Sandwich		02655	8	Osterville
	02644	14.7	Forestdale	02657	02652	12.4	North Truro
02568	02557	10.5	Oak Bluffs		02657	12.4	Provincetown
	02568	10.5	Vineyard Haven		02666	12.4	Truro
02571	02571	26.7	Wareham	02660	02638	9.9	Dennis
	02576	26.7	West Wareham		02641	9.9	East Dennis
02601	02601	17.4	Hyannis		02660	9.9	South Dennis
	02647	17.4	Hyannis Port	02664	02664	10.5	South Yarmouth
	02672	17.4	West Hyannisport	02668	02630	7.1	Barnstable
02631	02631	8.9	Brewster		02668	7.1	West Barnstable
02632	02632	12.6	Centerville	02673	02673	14	West Yarmouth
	02636	12.6	Centerville	02675	02637	8.9	Cummaquid
02633	02633	11.2	Chatham		02675	8.9	Yarmouth Port
	02650	11.2	North Chatham	02703	02703	14.2	Attleboro
	02659	11.2	South Chatham	02717	02702	17.6	Assonet
	02669	11.2	West Chatham		02717	17.6	East Freetown
02639	02639	13.5	Dennis Port	02718	02718	14.6	East Taunton

Table 7: Preventable Hospitalization (PH) Rates by ZIP Code *(continued)*

Some PH ZIP Codes include postal ZIP Codes for communities that have been grouped.

PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area	PH ZIP Code	USPS ZIP Code	PH Rate	City/Town/Area
02719	02719	17.4	Fairhaven	02777	02777	15.1	Swansea
02720	02720	27.5	Fall River	02779	02779	17.9	Berkley
	02722	27.5	Fall River	02780	02780	20.7	Taunton
02721	02721	31.8	Fall River	02790	02790	17.2	Westport
02723	02723	26.6	Fall River		02791	17.2	Westport Point
02724	02724	26.2	Fall River				
02726	02725	15.6	Somerset				
	02726	15.6	Somerset				
02738	02738	16.8	Marion				
02739	02739	10.1	Mattapoisett				
02740	02740	24.1	New Bedford				
	02741	24.1	New Bedford				
	02742	24.1	New Bedford				
02743	02743	13	Acushnet				
02744	02744	21.8	New Bedford				
02745	02745	18.9	New Bedford				
02746	02746	24.1	New Bedford				
02747	02747	13.3	North Dartmouth				
02748	02714	15.3	Dartmouth				
	02748	15.3	South Dartmouth				
02760	02760	12.6	North Attleboro				
	02761	12.6					
	02763	12.6	Attleboro Falls				
02762	02762	14.7	Plainville				
02764	02715	13	Dighton				
	02764	13	North Dighton				
02766	02712	18	Chartley				
	02766	18	Norton				
02767	02767	20.7	Raynham				
	02768	20.7	Raynham Center				
02769	02769	7.2	Rehoboth				
02771	02771	2.2	Seekonk				

Table 8: Ambulatory Care Sensitive (ACS) Conditions

Medical Conditions	ICD-9-CM Code
Angina	411.1, 411.8, 413
Asthma	493
Bacterial pneumonia	481, 482.2, 482.3, 482.9, 483, 485, 486
Cellulitis	681, 682, 683, 686
Chronic obstructive pulmonary disease	491, 492, 494, 496, 466.0
Congenital syphilis	090
Congestive heart failure	428, 402.01, 402.11, 402.91, 518.4
Convulsions	780.3
Dehydration	276.5
Diabetes	250.1, 250.2, 250.3, 250.8, 250.9, 250.0
Failure to thrive	783.4
Gastroenteritis	558.9
Grand mal status and epileptic convulsions	345
Hypertension	401.0, 401.9, 402.00, 402.10, 402.90
Hypoglycemia	251.2
Immunization related conditions	033, 037, 045, 320.0, 390, 391
Invasive cervical cancer	378
Iron deficiency anemia	280.1, 280.8, 280.9
Kidney/urinary infection	590, 599.0, 599.9
Nutritional deficiencies	260, 261, 262, 268.0, 268.1
Other tuberculosis	012, 013, 014, 015, 016, 017, 018
Pelvic inflammatory disease	614
Pulmonary tuberculosis	011
Severe ENT infections	382, 462, 463, 465, 472.1

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